DOCUMENT RESUME

ED 148 905 TM 006 899

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TITLE An Analysis of the Declines in ACT College Admissions Scores.
PUB DATE 77
NOTE 313p.; Master's Thesis, University of Wisconsin; for related document, see TM 006.516 ; Not available in hard copy due to marginal reproducibility of original

EDRS PRICE MF-$0.83 Plus Postage. HC Not Available from EDRS.
DESCRIPTORS Academic Ability; Academic Aspiration; *College Bound Students; *College Entrance Examinations; Economic Status; Educational Background; *Educational Trends; Enrollment Trends; Family Influence; Grade Point Average; Higher Education; High School Curriculum; Performance Factors; Racial Differences; School Demography; *Scores; Secondary Education; Sex Differences; Statistical Analysis; Student Characteristics; *Tables (Data); Test Reliability; Test Validity; Trend Analysis
IDENTIFIERS *American College Testing Program; Grade Inflation; *Test Score Decline

ABSTRACT

A number of tables present data on the changing characteristics of high school students taking the American College Testing Program examination (ACT), and on the declining ACT scores, from 1970 to 1975. A brief research review indicates that the observed declines are not merely a result of the tests themselves. The author suggests these explanations: (1) the increased proportion of female test takers, many of whom represent lower academic ability levels; and (2) high school grade inflation, which encourages less able students to perceive themselves as "college material," take the entrance examinations, and perform poorly. The author also concludes that the declines are not due to changes in the performance of racial minorities, since the declines have been steeper for Caucasian students. The declines are also marked for students who plan to attain a Bachelor's degree only. Though a variety of student background and demographic variables exert modest effects on scores, the strongest statistical relationship was found between high school enrollment in academic courses and test scores. The author suggests that the score decline may also be a result of the broader spectrum of students who aspire to college, and that this is acceptable because of the expanded educational opportunity. (Author/GDC)

AN ANALYSIS OF THE DECLINES IN ACT COLLEGE ADMISSIONS SCORES

BY

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A thesis submitted in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

(Sociology)

at the

UNIVERSITY OF WISCONSIN-MADISON

1977

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ACKNOWLEDGEMENTS

My primary debt for the completion of this thesis is to the American College Testing Program for kindly allowing me access to their data, and to William H. Sewell for arranging my contact with ACT. I would particularly like to thank Dr. E. James Maxey, not only for his scholarly assistance, but also for his hospitality and courtesy during my visit to the ACT office.

I am particularly grateful for the support and suggestions of the members of my thesis committee, William H. Sewell, Robert M. Hauser, and Michael R. Olneck. Readers who are familiar with their work will immediately recognize my debt to them.

Introduction

During the past decade, scores on standardized tests of cognitive skills given in the United States have steadily declined. This phenomenon has gripped the imagination of the public, the press, and scholars alike. A number of speculations as to the score decline have been offered, but there has been as yet no compelling, unambiguous explanation.

The purpose of this paper is to analyze a set of data from the American College Testing Program with the intention of systematically assessing the dimensions and some possible causes of the score decline. The data will first be displayed for a number of subpopulations and analyzed to determine where the declines have been steepest and where they have been less marked. Following this, a formal model designed to estimate the parameters of some plausibly causal determinants of a distribution of test scores will be constructed. The problem is such that certain methodological difficulties, which will be discussed, mitigate strongly against the drawing of any definitive conclusions, but the approach adopted here may contribute to a clarification of the score decline.

Two preliminary points will be made. First, one may argue that focusing on declines in standardized test scores is not as important as asking questions about how to improve the schools. This is reflected in the currently popular "back to basics" movement in many American high schools. The contention in this paper is that the question "Why are test scores declining?" logically precedes the question "What can be done about declining test scores?" The question

of whether the score decline dictates a reconstruction of the high school curriculum is an open one, and such policies should be preceded by a careful consideration of just what the declines represent.

Second, the recent score decline is unexplained, but just as problematic is the steady increase in test scores for the two decades preceding the inception of the current decline. Some analysts have suggested that the increase was due to society's increased emphasis on the quality of education (see Perry and Swanson, 1974; and Feldt, 1975, quoted in Munday, 1976), but for the most part the increase was uncritically accepted as a result of an assumedly improving educational system. The current trend has been defined as a problem, while the earlier trend was defined, if at all, as desirable and expected. The causes of each trend are uncertain, and both remain largely unexplained social facts.

A comprehensive overview of the test score decline has been compiled by Harnischfeger and Wiley (1975). They note the following trends in various tests:

> Scholastic Aptitude Test (SAT). Decline in verbal and mathematical scores over the past decade. Males have overtaken females in verbal scores, indicating steeper decline for females. Math declines less drastic than verbal and about equal for males and females, with females retaining lower scores than males.
>
> American College Testing Program (ACT). Decline in both English and math. Unlike SAT, females stay considerably above males in English and have less drastic drops than in SAT. Large decrease in Social Studies (especially for females). Natural Science scores stable.
>
> Preliminary Scholastic Aptitude Test (PSAT). No systematic declines in past decade (see below, p. 7). Males have overtaken females on verbal scores. Gap narrowed between male and female math scores, indicating a slight, though non-systematic, rise of females' test scores.

Minnesota Scholastic Aptitude Test (MSAT). Taken by over 90 percent of Minnesota high school juniors. Generally reproduces SAT and ACT trends.

Iowa Test of Basic Skills (ITBS). Spans grades 1-8. No declines in grades 1-3, but are declines in grades 4-8. Following earlier third graders through their schooling careers shows that they participate in declines in later grades.

Comprehensive Test of Basic Skills (CTBS). Span grades 2-10. Similar trends as ITBS. Losses expand with each increasing grade.

National Assessment of Educational Progress (NAEP). Assesses 9-, 13-, and 17-year-olds in four-year cycles. General declines in Science. Increases in Reading-Literacy Assessment. Declines among 17- and 13-year-olds in writing skills, although 9-year-olds improved somewhat. Preschoolers of 1972 lost three points when tested three years later. (Pp. 2-4)

While not all tests show precisely the same pattern, the general trend is clearly downward. In instances where the declines do not occur (most notably in the NAEP), this is probably attributable to the unusual content of the particular exam compared to the other exams. Both the SAT and the ACT have experienced declines of from 2 percent to 3 percent of a standard deviation each year for the past decade. This pattern seems to be similar in many other tests.

The SAT decline cannot be attributed solely to the addition of proportionately more scores to the lower end of the distribution. While there are more low scores, there are also proportionately fewer high scores. The proportion of SATV scores above both the 600 and 700 levels (the maximum score being 800) fell by one third between 1971-72 and 1974-75. The ACT likewise has reported an increased proportion of low scores, but differs from the SAT in that its proportion of high scores has remained stable. It is not obvious why this discrepancy should exist. The most notable difference in the two tests is that the ACT is given primarily in the Midwest, South,

and North Central regions of the United States, while the SAT is administered mainly in the East. It is not immediately clear why the ACT-tested areas should retain a constant proportion of high-scoring students while the East should experience a decline, but this may be useful to know.

Another characteristic of the general picture is that scores in grades 1-3 have shown no decline, perhaps even a slight increase, in the past decade. This too remains unexplained. This raises the possibility of interpreting the score decline as a cohort event, although the aforementioned pattern on the ITBS does not support this argument. Alternatively, perhaps tests designed to measure the reading skills of very young students are tapping a somewhat different dimension of reading ability than are tests designed for older students.

The decline can most accurately be viewed as a national rather than a regional phenomenon. As noted earlier, both the SAT, which is given primarily in the East, and the ACT, which is administered in the Midwest, South, and North Central United States, have experienced declines. It is interesting that the decline in the Western states is less marked[1] and that two North Central states have not shown declines.[2]

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[1] The median of the ACT Composite for eight Western states went from 19.6 in 1970-71 to 19.1 in 1974-75. In eight Southern states the figures are 18.4 and 17.4 and in ten North Central states 20.2 and 19.3 (Munday, 1976, p. 6).

[2] One state has gone from a 1970-71 median of 19.1 to a 1974-75 median of 19.2. A second state has remained at 20.5. Neither state is identified in the ACT reports.

Proposed Explanations for the Declines

Essentially, there are four types of explanations for the declining scores. One possibility is that the score declines merely represent the random fluctuation of test scores. This can be safely disregarded. Not only the ACT data of the present study, but also data from the SAT (a larger testing service) point to systematic declines over the past several years. Similar declines have been documented for various other tests (see again Harnischfeger and Wiley, 1975, pp. 2-4). Overall, these declines involve millions of people being tested over a period of several years. If the declines between any two years are small and could be attributed to chance, the larger pattern precludes this conclusion.

A second possibility is that the psychometric procedures used to equate each new form of the tests to previous forms have had the cumulative effect of making the tests more difficult. Such a drift in the test's scale could conceivably indicate that the reported declines are only artifacts of the testing instruments. Thus, if the unobserved "true score" of the test-taking population is invariant over time, these scaling and equating procedures would result in the appearance of a decline.

This does not appear to be the case. Research from SAT has shown that while a scale drift has occurred in the tests over the years, the nature of this drift has been such that it should actually be easier to obtain a good score now than earlier. Modu and Stern of SAT have reported that:

> "The implication of this study for the recent declines in SAT mean scores is clear, namely, that our op[illegible]tional

equating during the 1963-73 period have had the cumulative effect of making the December 1973 candidate group appear better than they are reported to be in relation to the 1963 and 1966 candidate groups. Thus, if anything, the reported scores underestimate the extent of mean score decline by about 14 to 17 points." (Modu and Stern, 1975, p. 20)

Thus, the score decline is even more severe than the reported drops would indicate. Harnischfeger and Wiley, using the Modu and Stern report, have demonstrated that the apparent stability of the PSAT is only an artifact of the scaling procedures. After appropriate corrections, the PSAT shows declines paralleling those of other examinations (Harnischfeger and Wiley, 1975, p. 32-33).

What little technical material is available from ACT (Tech. Rep. 1, 1973; Breland, 1975, p. 19) indicates similar conclusions.[3] The proper conclusion seems to be that the declines in test scores are real declines, and that the effect of the psychometric procedures is to underestimate the actual extent of the general decline.

A third possible explanation for declining scores concerns the unlimited variations on the theme "Kids are getting dumber." The basic idea here is that today's high school students are academically weaker than their counterparts of several years ago. A number of societal factors have been presented as leading to a population of students who have not learned as much as their predecessors. These include increased television viewing, increased drug usage, changes in the working patterns of the testees' parents, and changes in the

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[3] Maxey (personal communications) reports that preliminary analyses of scale drift in the ACT indicate that a slight, non-significant drift has occurred.

motivations and attitudes of more recent examinees. (See Harnischfeger and Wiley, 1975, pp. 75-113).

Harnischfeger and Wiley have suggested several school-related variables that may in some way be contributing to the score decline by negatively affecting students' academic skills. They strongly emphasize that these are only suggestions. Among the variables they offer are pupil mobility, organizational change, changes in the length of term or school year, average daily attendance, pupil absences, pupil suspensions, teacher strikes, parent boycotts, instructional losses for various reasons, curricular changes, changes in pupil motivation, and changes in teaching staff characteristics. Any of these variables could reasonably be hypothesized to be contributing to lower test scores.

Two particularly intriguing explanations have been offered for the supposed lower level of the present population of testees. Zajonc and his associates (Zajonc, 1976; Zajonc and Markus, 1975) have argued that the score decline is largely attributable to changes that have been occurring in family configuration. Specifically, Zajonc contends that the closer spacing of children that occurred as a result of the baby boom of the 1950s led to a decreased "intellectual environment of the home," which in turn led the children to perform less well on the exams. His "confluence model" further predicts that when post-baby boom cohorts start writing college entrance exams, scores will again begin to rise.

It is not feasible to comment extensively here on Zajonc's model. Two points will be made. First, Zajonc is very probably wrong. His

index of family intellectual environment is an oversimplified concept, most of the phenomena with which he is concerned would seem to be explainable in terms of more parsimonious models, and the data he uses do not really bear directly on the questions he is asking. Further, Zajonc seems to be misinterpreting the demographic effects of the baby boom.[4] Second, the data available for the present study do not allow his model to be adequately tested. The only question on the ACT Student Profile Section that speaks to this question at all is only available for the last three years, and reads "How many brothers and sisters under 21 years of age do you have?" Clearly this question is inadequate to test the confluence model, in that it allows no definitive answers on any facet of family configuration (i.e., spacing, birth order, family size, or sex composition) with which Zajonc is concerned.

Another approach involves curricular changes. It is certainly plausible that if today's students are taking fewer or less rigorous high school courses than their predecessors they may in fact be less academically capable than earlier testees. There has been little work done on this question, but some detailed national data are available for 1970-71 and 1972-73. (Gertler and Barker, 1972)

These data, collected by the National Center for Education Statistics, show decreases in enrollment in general grade-specific English courses and foreign language courses, both in absolute frequency and as a percentage of all students (see Table 1). There are declines in United States History and State History courses which have

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[4] For a more extended discussion, see Wright (1976).

Table 1a. Course Enrollments in Foreign Languages in the 1970-71 and 1972-73 School Years

Grand Total Language Courses	Total Freq.	Total Per.
1970-71	4712656	25.7
1972-73	4445472	23.9

Table 1b. Course Enrollments in History in the 1970-71 and 1972-73 School Years

	Grades 7 to 12 Freq.	Grades 7 to 12 Per.
U.S. History		
1970-71	4769686	26.0
1972-73	4500363	24.2
World History		
1970-71	2134566	11.6
1972-73	2165069	11.7
State History		
1970-71	1142972	6.2
1972-73	984471	5.3
Sub-Total		
1970-71	8047224	43.8
1972-73	7649903	41.2
Other History		
1970-71	1270868	6.9
1972-73	1708258	9.2
Grand Total		
1970-71	9318092	50.7
1972-73	9358161	50.4

Table 1c. Course Enrollments in the Natural Sciences in the 1970-71 and 1972-73 School Years

	1970-71		1972-73	
	Frequency	Percent	Frequency	Percent
Total General Science	4,652,306	25.2	4,056,739 (3,906,078)*	21.9 (21.1)*
Total Biology	3.667,444	19.9	4,240,242	22.8
Total Physical Sciences	4,452,445	24.2	4,178,451 (4,329,112)**	22.5 (23.3)**
Grand Total	12,772,195	69.3	12,475,432	67.2

* Figures in parentheses exclude enrollments in Intermediate Science Curriculum Study (ISCS) 7th and 8th grade courses.

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Table 1d. Course Enrollments in Subject Areas and Average Number of Courses per Pupil for Total Pupils Enrolled in Grades 7 to 12 of Public Secondary Schools: U.S., 1970-71 and 1972-73

Subject Area	1970-71		1972-73	
	Enrollment*	Mean Courses	Enrollment*	Mean Courses
English-Language Arts	25,852	1.405	24.079	1.296
Social Sciences	19,660	1.068	18,899	1.017
Mathematics	14,137	0.768	13,240	0.713
Natural Sciences	12,772	0.694	12,475	0.672
Music	6,559	0.356	6,111	0.329
Foreign Language	4,729	0.257	4,511	0.243
Physical Education	22,194	1.206	21,517	1.158
Practical Education	25,183	1.368	17,743	0.955
Other	233	0.013	9	--
Art	4,351	0.236	5,116	0.275
Total	18,407	7.641	18,577	6.658

*Enrollment is in thousands.

Source: Patterns of Course Offerings and Enrollments in Public Secondary Schools, 1970-71, and unpublished data. U.S. Department of Health, Education, and Welfare, National Center for Education Statistics.

been offset by increased enrollments in electives and specialized courses. Enrollment in general mathematics has decreased, while traditional college preparatory mathematics (Algebra, Geometry, and Trigonometry) have remained constant, indicating a total decline in mathematics enrollment. Large drops have occurred in both General Science and specific sciences (Biology, Chemistry, and Physics), with the decline increasing with more stringent mathematical prerequisites.

There is solid evidence that these decreases in academic course-taking are not being compensated for by increases in more practical enrollments, such as vocational, business, or home economics courses. The decline in these courses is also substantial. The indications are that students today probably spend less time receiving academic instruction than did their predecessors.[5] Obviously, this question (Are students less well prepared today?) is not as easily answered as the first two questions (Is the decline due to the random fluctuation of test scores? Are the tests getting harder?). There is no question but that today's students have experienced enormous changes of various nature--social, cultural, educational, economic, curricular--yet the impact of these changes upon test scores is unclear. The most accurate statement that can be made about the claim that today's students have actually learned less than their counterparts of earlier cohorts is that no one really knows.

A fourth possible explanation for declining scores emanates from

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[5] This all raises the question, which may or may not be important to the score decline, of just what today's students do during the school day.

the question "Who takes the tests?" This involves the idea that there is now a changed pool of testees, that is, that an increased proportion of students from the lower ability strata of their high school classes are now writing the exams. This implies that the overall level and distribution of "ability" in high schools may have remained constant (or even increased) over time, but that the changed pool of examinees has led to the decline.

This is at once an appealing theory and a statistical nightmare. The problem is one of selection, and can be most clearly stated by noting that there is absolutely no assurance that each cohort of testees is equally representative of its respective cohort of high school age individuals. More than that, there is absolutely no assurance that the subpopulations of any given group of testees are as representative of their cohorts as are comparable subpopulations of other cohorts. For example, blacks writing the exams in 1970 may be a more highly selected group of students than blacks writing the exams in 1975, or vice versa. It follows from this that even if the distribution of any number of variables (i.e., race, sex, educational plans, parental income, etc.) is precisely the same from year to year, this does not establish that the test-taking populations represent their larger cohorts equally well from year to year.

The problem of selection merits a bit more attention. Kerlinger (1973) has written that "Self-selection occurs when the members of the groups being studied are in the groups, in part, because they differentially possess traits or characteristics extraneous to the research problem." (p. 381) He continues that "Self-selection into

samples occurs when subjects are selected in a nonrandom fashion into a sample," and that "The crux of the matter is that when assignment is not random, there is always a loophole for other variables to crawl through." (p. 382)

Self-selection can profitably be thought of as a special case of nonresponse. The effect of nonresponse is to introduce bias, yet this bias cannot be properly assessed in the absence of information about the nonrespondents (in this case, students who do not write the exams). Thus, in a sense, the question "What are the characteristics of those who do not take college entrance examinations?" is analogous to the question "What are the characteristics of those who do not respond to questionnaires?", in that the bias introduced by selection cannot be measured unless one knows something of the characteristics of those not in the sample.

Self-selection in the present study occurs on the basis of both the dependent and independent variables. It is necessary to explicitly state that the analyses reported here pertain only to the population of ACT-testees for the past six years; extrapolation beyond that population is unwarranted.

Returning to this proposed explanation, the best indication that the pool is changing can be obtained by observing the patterns of standard deviations from year to year, the idea being that increasing standard deviations suggest a more heterogeneous group of testees. A number of researchers have paid some attention to this (Munday, 1976; Harnischfeger and Wiley, 1975), and this strategy will be employed in

this study.[6]

The data available for this study (which will be described shortly) allow many, though by no means all, of these questions to be addressed. Even given the problems of measurement error (including the problem of nonresponse to specific questions on the SPS), omitted variables, and self-selection, the ACT data provide a number of variables capable of assessing many previously untested hypotheses. In addition to five kinds of test scores (English, Mathematics, Social Studies, Natural Science, and a Composite Score which is an average of the four exams), the sample also includes data on sex, high school grades, educational plans, parental income, race, and high school size for the six years from 1970-1975. In addition, the following variables exist for the most recent three years: size of the student's home town (i.e., a rural/urban measure), number of siblings (with the aforementioned deficiencies), the type of college the student plans on attending, and a variety of high school curricular variables. There are thus a number of variables by which test scores may be either broken down into subpopulations and subsequently analyzed, or which may be used as independent variables in a formal model.

Before leaving the discussion of possible explanations, it might be noted that a given explanation may be especially important in a particular year, while in another year an alternative explanation may

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[6]This approach is not foolproof, and its usefulness is conditional on the assumptions one is willing to make about the form of the test score distribution. Increased standard deviations do not necessarily imply increased heterogeneity of the test-taking population; perhaps one is merely sampling from a different part of the distribution. Thus, while this is an intuitively appealing approach, it will be supplemented by a number of cross-tabulations and breakdowns of the data.

be of greater significance. This again points to the enormous complexity of the problem.

Sample

The sample for this study consists of a one percent random sample of ACT-testees for each of the six years from 1970-71 to 1975-76. Sample sizes for each of these years are 8,033; 6,774; 7,375; 7,403; 7,144; and 6,918, for a total of 43,647. While the sample is representative of ACT-testees, it is not necessarily representative of the population of American high school students. Students from the Eastern United States are almost completely excluded, and two non-Eastern states, Wisconsin and Minnesota, have recently dropped the tests. Because of ACT's policy of insuring confidentiality, all labels identifying state of residence were removed from the sample. This removes the possibility of assessing the effect of Wisconsin and Minnesota being excluded from later cohorts of testees.

Further, the sample excludes the sizable proportion of high school students not planning on college and hence not taking the tests, and there is no way to assess the impact of the changing persistence of students to high school graduation. This again raises the issue of selection. More serious problems of selection arise from the facts that not all college-bound students are required to write college entrance examinations, and that the characteristics of college-bound students may change from year to year. It is difficult to assess just what direction the bias introduced by this selection factor will take. For example, there is some evidence that the movement toward open admissions, particularly to two-year colleges, means that more students

with somewhat lower qualifications are now taking the exams.[7] At the same time, however, several large state universities seem to be de-emphasizing the tests, and it is difficult to tell what emphasis private, elite institutions are currently placing on the exams. Policies regarding the exams may shift from year to year, and there exists little if any systematic data on these shifts. Hence, there is no assurance that the six cohorts in the sample are equally representative of their respective cohorts.

The most that can be said, then, is that the sample is representative of ACT-testees for the period under consideration. This should not be taken too lightly. A large proportion of American high school students do go on to college, the sample is a large one, and the area covered by the ACT is both vast and heterogeneous.

Data

The data to be analyzed here come mainly from the Student Profile Section (SPS) of the ACT-Assessment. This is an eight-page booklet completed by all students taking the exams. The questions pertain to ten basic areas: admissions/enrollment information; educational plans, interests, and needs; special educational needs, interests, and goals; college extracurricular plans; financial aid; background information; factors influencing college choice; high school information; high school extracurricular activities; and out-of-class accomplishments.

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[7] For information on the movement toward two-year colleges, see Johnson, 1973; Peterson, 1972; Carnegie Commission, 1970, 1973; and Wade, 1973.

Variables

Sex - This is coded "1" for males and "0" for females.

High School Grades - The ACT reports high school grades in English, Mathematics, Social Studies, and Natural Science. These are taken from school records, and are coded as one-digit numbers from 0 to 4. There are two measures of overall high school grade point average. The first is taken from school records and is calculated to two decimal places. The second is self-reported and constitutes a 1 to 7 scale, with 1 corresponding to a D- to D and 7 corresponding to an A- to A. Because of its greater detail and assumed greater reliability, the former measure was used. The two measures have a zero-order correlation of .77. Table 2 shows the zero-order correlations between these two measures and some pertinent variables.

Educational Plans - This information was elicited from the question "What is the highest level of education you expect to complete?" In 1970-71 through 1972-73, the following alternatives were given: 0) high school diploma; 1) Vocational, technical, or certificate program (less than two years); 2) Bachelor's degree or equivalent; 3) One or two years of graduate or professional study (M.A.; M.B.A., etc.); 4) Doctor of philosophy or doctor of education (Ph.D. or Ed.D.); 5) Doctor of medicine or dental surgery (M.D. or D.D.S.); 6) Law degree (LL.B. or J.D.); 7) Bachelor of Divinity (B.D.); and 8) Other. In the latter three years, the fourth, fifth, and sixth categories were collapsed, and the first and seventh were dropped. For use in regression analysis, this was transformed into a dummy variable, with "1" corresponding to respondents planning on a four-year degree or

Table 2. Correlations of Different Measures of Grade Point Averages with Selected Variables

	Self-Reported GPA	School-Reported GPA	Self-Reported Class Rank	ACT Composite
School-Reported GPA	.77			
Self-Reported Class Rank	.61	.66		
ACT Composite	.51	.54	.49	
School-Reported English Grade	.62	.76	.48	.41

more, and "0" including all respondents aspiring toward lesser degrees.

Race - The early forms of the SPS list six responses for race: Afro-American/black; American Indian; Caucasian/white; Mexican/Spanish American; Oriental American; and Other or I prefer not to respond. Later forms expanded "American Indian" to read "American Indian/Native American/Aleutian (Eskimo)"; divided the Mexican/Spanish American category into "Mexican American or Chicano" and "Puerto Rican or Spanish-Speaking American"; and divided the final response into "Other" and "I prefer not to respond." For this analysis, these categories are normally collapsed back into the listing of the earlier questionnaires. For inclusion in regression equations, they are recoded in terms of white/nonwhite, with "1" being set equal to white.[8]

Years Certain Subjects Studied - The SPS asks students how many years (in half-year increments) they have studied the following high school subjects: English, Mathematics, Social Studies (history, civics, geography, economics); Natural Sciences (biology, chemistry, physics), Spanish, German, French, other foreign language, business or commercial subjects, and vocational or occupational subjects. Possible values for each of these measures run from 0 to 8.

Parental Income - The SPS contains a measure of parental income. Eight income categories are given, and students are asked to indicate

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[8] Since Oriental Americans writing the exams appear to be a highly selected group, one might have coded them differently. In light of the small proportion of the test-taking population which they constitute, however, this should not create a serious problem. Also, there are conceptual reasons for maintaining a white/nonwhite dichotomy.

their families' annual income before taxes. After a number of attempts to use this variable in various statistical analyses, I elected to use it very sparingly. This comes from two basic considerations: 1) The variable is almost certainly poorly measured. One has every right to be skeptical about the accuracy of students' perceptions of their parents' income;[9] and 2) the same intervals were used from year to year during a period of severe economic inflation. Clearly, belonging to a given category in 1970 is not the same as belonging to the same category in 1975. The effect of this showed up again and again when this variable was used, to the point that it seemed advisable to disregard the measure.

High School Size - While this variable was not originally hypothesized to be especially important, it was one of the few variables available for all six years and was therefore included. Probably the best way to conceptualize it is as a weak proxy for either school contextual effects or rural/urban differences. The information is a response to a question asking for the number of students in the testee's high school graduating class. Classes with less than 199 students were coded "0"; larger classes were coded "1".

Siblings - This variable actually measures the number of siblings under the age of twenty-one, and may usefully be thought of as a product of sibship size and a variable inverse to birth order. As a

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[9] Bielby (1976) has reported that respondents in the Occupational Changes in a Generation survey are frequently uncertain about their reports of parental income.

measure of family size, its effects will be underestimated.

High School Type - This is coded as "1" if the student attended a public high school; other responses were coded "0".

College Type - This was coded as "1" if the student plans on attending a four-year institution, whether public or private. Other responses were coded "0".

College Size - This too was coded as a dummy variable, with "1" corresponding to colleges over 10,000 students, and "0" corresponding to smaller colleges.

Town Size - Students from home towns with less than 50,000 people recieved a "0"; students from larger towns were coded "1".

Cohort and Interaction Effects - A series of five dummy variables was constructed to assess cohort effects. The omitted category was 1970, the first year of the sample, which means that cohort effects can be interpreted as deviations from the 1970 mean. To test for sex by cohort interactions, five variables were created to deal with these effects. These will be explained in more detail later.

Omitted Variables

Most sociological studies have been subject to the problem of omitted variables. Of particular importance in this study is the absence of measures of father's education and father's occupation, each of which is of crucial importance in research attempting to explain variations in measures of educational achievement (see, for example, Blau and Duncan, 1967; Jencks et al., 1972; Sewell and Hauser, 1975). One could also argue that measures of "ability", such as a ninth grade achievement test, or a measure of motivation would

provide a more adequate specification of the model. Further, no information is available on the student's state of residence. In addition, many of the most potentially interesting variables are only available for three years.

Measurement Error

The questions on the SPS were not designed to address the problem of a test score decline. Rather, they were meant to elicit information pertaining to other interests of the ACT, notably supplying colleges with predictive information about students and providing college-bound students with financial aid. Hence, the questionnaire was not constructed as one might like for the purposes of this study. The upshot of this is that many of the independent variables will inevitably be marked by considerable--and largely untestable--errors of measurement.

There is a growing literature on the problem of measurement error (see, for example, Bielby, 1976; Bielby, Hauser, and Featherman, 1976; the papers in Blalock, 1972; Siegel and Hodge, 1968). The issue is well-stated by Duncan (1975), who observes "Error in the dependent variable, if 'well behaved', does not bias the ordinary least squares estimate. But error in the independent variable, even though 'well behaved', imparts a downward bias to the OLS estimate." (p. 117)

For various reasons, it seems reasonable that many of the independent variables in this study will be subject to substantial measurement error. Two particularly important questions, those pertaining to parental income and number of siblings, were each worded in such a way as to attenuate the validity of the responses. The high rate of nonresponse to the race question can also be seen as a problem of

measurement.

The dependent variables, the five ACT scores, are less problematic regarding errors of measurement, as the subsequent discussion of the tests' validity and reliability will attest. The problem is, however, more serious with the exogenous variables. Thus, many of the parameters of the regression of test scores on a variety of exogenous variables will almost certainly be underestimated. Other than explicitly recognizing these limitations on the model, there is little that can be done here to alleviate the situation.

Accuracy of Self-Reports

One might easily be skeptical about the accuracy of students' self-reports of various items on the SPS. This question has been dealt with by the ACT (Tech. Rep., 1, 1973) and by Maxey and Ormsby (1971). By checking self-reports against data from school records, the ACT concluded that "students typically report their out-of-class accomplishments in a reliable and honest manner." (p. 318) Maxey and Ormsby too comment on the accuracy of self-reports of high school grades and items of non-academic achievement.

These reports are reassuring to an extent, but leave open the question of the accuracy of such problematic variables as parental income, high school curriculum, high school rank, and number of years studied certain subjects. Maxey and Ormsby cite an unpublished paper by Birnbaum (1971), who argues that "students with low achievement were much more likely to be discrepant reporters than high achievement students." If in fact more low achieving students are now writing the exams, as the depressed scores would suggest, it is possible that

the accuracy of self-reports has decreased. St. John (1970), Kerckhoff, Mason, and Poss (1973), and Mason et al. (1975) have questioned the accuracy of students' self-reports of various family characteristics, but the most one can conclude here is that some inassessable amount of inaccuracy of self-reports is present in the data. Discrepant reporting is yet another case of measurement error, and operates to attenuate the relationships involving the less accurately reported variables.

Reliability of the ACT Exams

Research from the ACT (Tech, Rep., 1, 1973) has reported on the reliability of the exams in English Usage, Mathematics Usage, Social Studies Reading, Natural Science Reading, and the ACT Composite. They assess the tests in terms of three types of estimates of reliability or precision of measurement.

The first measure involves the correlation between the odd-numbered and the even-numbered items when corrected for attenuation by the Spearman-Brown formula, and is known as odd-even reliability or split-half reliability. The second measure is the Kuder-Richardson formula 20, and is computed from items and total score statistics of the test. Finally, the measure coefficient alpha is used, which is a more general version of the K-R 20 formula. The ACT report refers the reader to a number of detailed expositions of these measures (p. 101-102), but note that:

> "All these measures are estimates of the precision or reliability of the test defined as the ratio of true score variation to total variation. When the assumptions for the three measures are met, they give a lower bound for the estimates of reliability. However, the common violations of the assumptions inflate the estimates so that these lower bound properties are rarely achieved in practice." (p. 102)

Tables 3 to 5 present data on the reliabilities of each of the tests. ACT interprets these results as showing that "considering the deflating and inflating effects of each type of estimate, figures in the range of .80 to .85 probably provide the most reasonable estimates of true score variation to total variation for the four tests of the ACT Assessment with the estimate for the Composite even higher." (p. 104)

Validity of the ACT Exams

The ACT has considered in some detail the content validity of the tests (see Tech. Rep., 1, 1973; Munday, 1976). They define content validity as "the quality of the sample of content from a specified content domain." (Tech. Rep., 1, p. 83) Charts 1 to 4 shows the content of each of the ACT exams. These are extensively discussed in the report, with results which "all tend to support the interpretive use of the ACT tests as measures of developed academic abilities. There are some limitations on the interpretation in terms of the content of the tests and their generalizability to unusual circumstances. However, on the whole the interpretation and its implications appear to be appropriate." (p. 125)

In sum, data on both the reliability and the validity of the tests suggest a sophisticated testing instrument. Like any standardized test they are fallible, but on the whole the tests do provide an indicator that is measuring the same thing about equally well from year to year, at the same time precluding the conclusion that the score decline is an artifact of the instability of the tests.

Dimensions of the Decline in the Present Sample

There are three basic ways of looking at trends in test scores.

Table 3. Summary of Odd-Even Reliabilities for the ACT Assessment

	Median (Range) of Reliabilities	Median (Range) of Standard Errors of Measurement[a]
English Usage	.90 (.87-.92)	1.49 (1.39-1.72)
Mathematics Usage	.88 (.86-.90)	2.21 (2.06-2.53)
Social Studies Reading	.87 (.82-.88)	2.34 (2.20-2.66)
Natural Sciences Reading	.85 (.82-.88)	2.41 (2.06-2.50)
Composite	.96 (.95-.96)	1.04 (0.97-1.08)

Note.--Based on the 10 forms of the ACT Assessment in use from 1967 to 1971. Each reliability figure was computed on a sample from a regular national test date with the sample sizes ranging from 981 to 1,001 for each of the 10 forms. The test score variances in each sample approximated those of the national ACT-tested college-bound population described in Table 5.9.

[a]The standard errors of measurement are based on scaled test scores which range from 1 to 36 with a national mean of approximately 20.

Source.--ACT Technical Report. Vol. 1.

Table 4. Summary of K-R 20 Reliabilities for the ACT Assessment

	Median (Range) of Reliabilities	Median (Range) of Standard Errors of Measurement[a]
English Usage	.89 (.87-.90)	1.74 (1.44-1.79)
Mathematics Usage	.89 (.85-.91)	2.14 (1.96-2.45)
Social Studies Reading	.85 (.80-.89)	2.56 (2.25-2.72)
Natural Sciences Reading	.84 (.80-.87)	2.37 (2.15-2.58)
Composite[b]	.91	1.44

Note.--Based on the 12 forms of the ACT Assessment in use from 1968 to 1972. Each reliability figure was computed on a sample from a regular national test date with the sample sizes ranging from 981 to 2,913 for each of the 12 forms. The test score variances in each sample approximated those of the national ACT-tested college-bound population described in Table 5.9.

[a]The standard errors of measurement are based on scaled test scores which range from 1 to 36 with a national mean of approximately 20.

[b]Reliability of the Composite was computed from the median subtest reliabilities in this table and intercorrelations and standard deviations from Table 5.9 using formulas given by Lord and Novick (1968; p. 85). The standard error of estimate was then computed using the reliability estimate and the median standard deviation of the Composite for the 12 forms.

Source.--ACT Technical Report, Vol. 1.

Table 5. Summary of Coefficient Alpha Reliabilities for the ACT Assessment

	Median (Range) of Reliabilities	Median (Range) of Standard Errors of Measurement[a]
English Usage	.77 (.75-.83)	2.37 (2.13-2.82)
Social Studies Reading	.77 (.70-.80)	3.17 (2.79-3.58)
Natural Sciences Reading	.73 (.66-.79)	3.16 (2.73-3.36)
Composite	.85 (.82-.87)	1.91 (1.84-1.99)

Note.--Based on the 12 forms of the ACT Assessment in use from 1968 to 1972. Each reliability figure was computed on a sample from a regular national test date with the sample sizes ranging from 981 to 2,913 for each of the 12 forms. The test score variances in each sample approximated those of the national ACT-tested college-bound population described in Table 5.9. The individual units of each test used in the analysis were the passages on which questions were based with the information questions treated as a unit. Thus, each test had approximately five units and alpha for the Composite was based on the four subtests as units.

[a]The standard errors of measurement are based on scaled test scores which range from 1 to 36 with a national mean of approximately 20.

Source.--ACT Technical Report, Vol. 1.

CHART 1

Content of the ACT English Usage Test*

Grammar and punctuation. This includes punctuation and graphic conventions, usage in agreement, verb forms, adjectives and adverbs, pronouns and their antecedents, and nouns.

Sentence structure. This includes relation between clauses, parallelism, placement of modifiers, and predication and shifted constructions.

Diction. Under this rubric are items concerned with word choice and idioms, figurative language, and economical writing.

Logic and organization. Included here are logical organization of ideas, the elimination of inappropriate ideas and statements, proper wording of transitions, paragraphing, and appropriate conclusions.

English Usage Content Area	Proportion of Test	No. of Items
Grammar and Punctuation	.35	26
Sentence Structure	.25	19
Diction	.35	26
Logic and Organization	.05	4
Total	1.00	75

*Taken from Technical Report for the ACT Assessment Program, Iowa City, Iowa; American College Testing Program, 1973.

CHART 2

Content of the ACT Mathematics Usage Test*

Arithmetic and algebraic reasoning. These problems are word problems about practical situations in which algebraic and/or arithmetical reasoning is required. The problems require the student to interpret the question and find an approach to its solution. Some of the problems may require only advanced arithmetic for solution while others call for algebraic approaches.

Arithmetic and algebraic operations. In these problems, operations to be performed are explicitly described in the problem and the student must complete the designated operation. These problems include manipulation of fractions and decimals, operations with signed numbers, addition, subtraction, multiplication, and division of polynomials, solution of

CHART 2 (continued)

linear equations in one unknown, and manipulation of algebraic fractions.

Advanced algebra. These problems include dependence and variation of quantities related by given formulas, arithmetic and geometric series, solution of simultaneous equations, graphs of equations, inequalities, logarithmic principles, exponents, radicals, roots of equations, factoring and dividing polynomials, solution of quadratic equations.

Geometry. Topics include mensuration of lines and plane surface, properties of polygons, angular relationships involving parallel lines and polygons, relationships involving circles and properties of circles, loci, solid geometry, trigonometric principles, and the Pythagorean therom. Both formal and applied problems are included under this category with most being formal.

Miscellaneous. This category includes problems in set theory, probability, logic, properties of numbers (prime, rational), and bases of number systems.

Mathematics Content Area	Proportion of Test	No. of Items
Arithmetic and Algebraic Reasoning	.35	14
Arithmetic and Algebraic Operations	.15	6
Advanced Algebra	.20	8
Geometry	.20	8
Miscellaneous	.10	4
Total	1.00	40

*Same as Chart 1

CHART 3

Content of the ACT Social Studies Reading Test*

Social Studies Area	Inference Items (Proportion of Test)	Inference Items (No. of Items)	Information Items (Proportion of Test)	Information Items (No. of Items)	Total (Proprotion of Test)	Total (No. of Items)
European and Ancient History	.14	7	.06	3	.20	10
Government and American History	.28	15	.12	6	.40	21
Current Social Issues, Sociology, Economics, etc.	.28	15	.12	6	.40	21
Total	.70	37	.30	15	1.00	52

*Same as Chart 1.

CHART 4

Content of the ACT Natural Sciences Reading Test*

Science Area	Inference Items (Proportion of Test)	Inference Items (No. of Items)	Information Items (Proportion of Test)	Information Items (No. of Items)	Total (Proportion of Test)	Total (No. of Items)
Biology	.36	19	.12	6	.48	25
Chemistry	.17	9	.06	3	.23	12
Physics, Geology, Astronomy, and General Science	.17	9	.12	6	.29	15
Total	.70	37	.30	15	1.00	52

*Same as Chart 1.

First, one may examine the patterns of means and standard deviations over time for each of the tests and for a variety of subpopulations. The idea behind analyzing standard deviations is that they may indicate changes in the variability of the test-taking population. Decreasing means accompanied by increasing standard deviations would seem to suggest that the distribution being sampled is changing (i.e., becoming more heterogeneous).

Second, one may look at percentage/frequency distributions, again for each of the tests and for various subpopulations. This allows one to determine the relative proportion of scores in any given range, and shows if the proportion of very high or very low scores is changing over time.

Finally, one may construct a model relating test scores to a variety of exogenous variables. This allows one to estimate the parameters involved in the process of generating a distribution of test scores, and can indicate places where "the world works differently" for, say, English and Math scores.

General Trends

Table 6[10] shows trends in means and standard deviations over the past six years. The table shows that English scores have declined an average of 2 percent of a standard deviation per year over the period,[11]

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[10]The data for this table and all subsequent tables are drawn from the present sample.

[11]Since the distribution of scores on the four exams are somewhat different, a one point decline on one exam is not necessarily the same as an equal decline on another. This makes it reasonable to discuss declines as percentages of standard deviations.

Table 6. Means and Standard Deviations of ACT Exams, 1970 to 1975

Year	English	Math	Social Studies	Natural Science	Composite	N
1970	18.06 (5.55)	19.09 (7.15)	18.76 (7.08)	20.52 (6.31)	19.23 (5.56)	8033
1971	17.76 (5.53)	18.84 (7.21)	18.61 (7.18)	20.52 (6.46)	19.06 (5.62)	6774
1972	18.18 (5.25)	19.24 (7.10)	18.45 (7.47)	20.89 (6.36)	19.31 (5.66)	7375
1973	17.85 (5.18)	18.31 (7.40)	18.05 (7.63)	20.79 (6.33)	18.86 (5.70)	7403
1974	17.72 (5.29)	17.57 (7.87)	17.35 (7.58)	21.03 (6.29)	18.55 (5.83)	7144
1975	17.45 (5.34)	17.44 (7.59)	17.00 (7.27)	20.84 (6.53)	18.30 (5.81)	6918
Total	17.85 (5.36)	18.43 (7.42)	18.05 (7.40)	20.76 (6.38)	18.90 (5.71)	43647

but that the 1972-73 administration of the test produced no decline over the previous year. Math scores have declined an average of 4 percent of a standard deviation per year, again with a break in the pattern in 1972-73. Social Studies scores have declined systematically, with some indications that the scores are showing more variation. Both the means and standard deviations of Natural Science scores have been markedly stable. Finally, the means of the Composite scores have declined regularly (again with a reversal in 1972-73), while the standard deviations have risen.[12]

Table 7 shows a percentage distribution of English scores for the period. The results show an increased proportion of low scores in more recent years, particularly if one considers scores between 13 and 18. This discrepancy exists until scores reach about the 90th percentile, indicating that there has been little change over time in English scores above 25, but considerable change elsewhere in the distribution.

There is a marked increase in the proportion of low Math scores throughout the distribution (see Table 8). This is accompanied by a noticable decrease in high Math scores.

Table 9 indicates a considerable increase in low Social Studies scores. This disparity remains until scores reach about the 98th percentile.

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[12] An interesting question is why the four exams have experienced different trends. Since everyone in the sample took all four tests, theories involving a changed pool of testees cannot speak to the issue of differential declines. The results may suggest that high schools are maintaining a strict natural science curriculum, even as qualifications are apparently declining in other areas. Alternatively, perhaps the sample is being increasingly selected on natural science ability.

Table 7: Distribution of ACT English Scores by Year, 1970 to 1975

Score Interval	Year 1970	1971	1972	1973	1974	1975	Total
	Percentage Distribution						
0-6	2.9	3.3	1.4	1.5	2.1	2.5	2.3
7-12	15.8	15.1	16.1	15.8	16.7	17.3	16.1
13-18	26.7	30.6	30.8	34.2	33.9	35.1	31.8
19-24	45.3	42.0	42.0	40.4	39.4	38.0	41.3
25-30	9.1	8.7	9.1	7.6	7.5	6.8	8.1
31-36	0.3	0.3	0.6	0.6	0.4	0.4	0.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	(8033)	(6774)	(7375)	(7403)	(7144)	(6918)	(43647)
	Cumulative Percentage Distribution						
0-6	2.9	3.3	1.4	1.5	2.1	2.5	2.3
7-12	18.7	18.5	17.5	17.2	18.7	19.8	18.4
13-18	45.4	49.1	48.3	51.4	52.7	54.9	50.2
19-24	90.6	91.1	90.3	91.8	92.1	92.8	91.4
24-30	99.7	99.7	99.4	99.4	99.6	99.6	99.6
31-36	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 8. Distribution of ACT Math Scores by Year, 1970 to 1975

Score Interval	Year 1970	1971	1972	1973	1974	1974	Total
	Percentage Distribution						
0-6	3.7	4.9	4.1	5.6	9.4	8.1	5.9
7-12	12.9	13.4	13.5	17.3	17.6	18.7	15.5
13-18	33.1	33.9	33.1	32.0	29.3	29.0	31.7
19-24	23.1	22.3	20.7	20.8	18.8	20.7	21.1
25-30	22.3	21.1	24.5	20.7	22.2	20.7	21.9
31-36	4.6	4.4	4.1	3.7	2.8	2.8	3.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	(8033)	(6774)	(7375)	(7403)	(7144)	(6918)	(43647)
	Cumulative Percentage Distribution						
0-6	3.7	4.9	4.1	5.6	9.4	8.1	5.9
7-12	16.6	18.3	17.6	22.9	27.0	26.8	21.4
13-18	49.7	52.2	50.8	54.8	56.2	55.8	53.2
19-24	72.8	74.5	71.4	75.6	75.0	76.5	74.2
25-30	95.1	95.6	95.9	96.3	97.2	97.2	96.2
31-36	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 9. Distribution of ACT Social Studies Scores by Year, 1970 to 1975

Score Interval	Year						
	1970	1971	1972	1973	1974	1975	Total
	Percentage Distribution						
0-6	5.2	5.3	5.7	7.2	7.7	6.0	6.2
7-12	18.5	19.7	22.3	21.9	24.7	28.6	22.5
13-18	20.6	18.8	17.9	17.3	19.2	21.3	19.2
19-24	31.3	31.0	28.6	29.9	27.1	24.8	28.8
25-30	22.5	23.2	23.3	21.5	18.8	17.6	21.2
31-36	2.0	1.9	2.2	2.2	2.4	1.6	2.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	(8033)	(6774)	(7375)	(7403)	(7144)	(6918)	(43647)
	Cumulative Percentage Distribution						
0-6	5.2	5.3	5.7	7.2	7.7	6.0	6.2
7-12	23.6	25.0	28.0	29.0	32.4	34.6	28.7
13-18	44.2	43.8	45.9	46.4	51.7	56.0	47.9
19-24	75.5	74.9	74.5	76.3	78.8	80.7	76.7
25-30	98.0	98.1	97.8	97.8	97.6	98.4	97.9
31-36	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 10. Distribution of ACT Natural Science Scores by Year, 1970 to 1975

Score Interval	Year						
	1970	1971	1972	1973	1974	1975	Total
	Percentage Distribution						
0-6	1.2	1.6	1.0	0.7	0.5	1.0	1.0
7-12	7.5	8.0	7.2	7.4	6.2	8.5	7.5
13-18	31.8	30.3	32.9	33.3	33.0	29.1	31.8
19-24	29.3	29.8	26.9	28.9	29.0	29.1	28.8
25-30	25.7	24.8	25.7	22.5	23.7	25.3	24.6
31-36	4.5	5.6	6.3	7.3	7.6	6.9	6.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	(8033)	(6774)	(7375)	(7403)	(7144)	(6918)	(43647)
	Cumulative Percentage Distribution						
0-6	1.2	1.6	1.0	0.7	0.5	1.0	1.0
7-12	8.7	9.6	8.2	8.1	6.7	9.5	8.5
13-18	40.5	39.9	41.1	41.4	39.7	38.7	40.2
19-24	69.8	69.7	68.1	70.3	68.7	67.8	69.1
25-30	95.5	94.4	93.7	92.7	92.4	93.1	93.7
31-36	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 11. Distribution of ACT Composite Scores by Year, 1970 to 1975

Score Interval	Year 1970	1971	1972	1973	1974	1975	Total
	Percentage Distribution						
0-6	0.7	0.8	0.4	0.6	0.8	0.8	0.7
7-12	12.0	13.1	12.9	14.3	16.4	18.1	14.4
13-18	32.0	32.0	31.3	33.2	32.4	32.2	32.2
19-24	35.2	35.0	35.0	33.5	32.7	32.0	33.9
25-30	19.1	18.3	19.3	17.3	16.8	16.3	17.9
31-36	0.8	0.8	1.1	1.1	0.9	0.6	0.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	(8033)	(6774)	(7375)	(7403)	(7144)	(6918)	(43647)
	Cumulative Percentage Distribution						
0-6	0.7	0.8	0.4	0.6	0.8	0.8	0.7
7-12	12.9	13.9	13.4	14.9	17.2	18.8	15.1
13-18	44.9	45.9	44.6	48.1	49.7	51.0	47.3
19-24	80.1	80.9	79.6	81.6	82.3	83.1	81.2
25-30	99.2	99.2	98.9	98.9	99.1	99.4	99.1
31-26	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 12. Changes in Sex Composition of ACT Testees, 1970 to 1975

	Sex		
Year	Male	Female	N
1970	49.9	50.1	8037
1971	50.0	50.0	6774
1972	49.0	51.0	7375
1973	47.6	52.4	7403
1974	46.5	53.5	7144
1975	45.3	54.7	6918
Total	48.1	51.9	43647

Table 10 shows that the distribution of Natural Science scores has been relatively stable over the period. If anything, more recent administrations of the test may be marked by fewer low scores and an increased proportion of high scores.

Finally, Composite scores show a marked tendency toward increased proportions of low scores (see Table 11). This seems to be accompanied by a slightly smaller proportion of students scoring in the highest ranges of the distribution.

Trends in Exogenous Variables

Before looking at the score patterns for different subgroups, it will be useful to assess what changes have been occurring in the distribution of demographic and school-related characteristics of the population in the last six years. While this breaks up the present continuity somewhat, it will make the later presentation clearer. The most striking change in the sample from year to year is the changing sex composition (see Table 12). The proportion of female testees has gone from 50.1 percent in 1970-71 to 54.7 percent in 1975-76. A similar pattern has been documented for the SAT (see Harnischfeger and Wiley, 1975, p. 24).

The response to the question "What is the highest level of education you expect to complete?" has varied little over the six years (see Table 13). The only noticable change is the declining proportion of students aspiring toward a two-year college degree, which could either reflect a real trend away from this level of education or the possibility that fewer two-year institutions are requiring the tests.

The distribution of responses to the question regarding parental

Table 13. Distribution of Educational Degree Aspirations of ACT Testees, 1970 to 1975

Year	Educational Plans							
	Vocational/ Technical	2-Year Degree	Bachelor's Degree	Master's Degree	Professional Degree	Other	Missing	N
1970	4.3	15.5	41.4	18.1	12.5	6.4	1.9	8033
1	4.7	16.0	39.1	18.5	14.0	6.2	1.6	6774
1972	4.2	16.4	39.5	17.1	15.0	5.7	2.2	7375
1973	4.2	16.4	38.5	15.7	18.1	6.2	0.9	7403
1974	3.6	13.6	41.2	15.0	17.4	5.3	4.0	7144
1975	3.8	12.9	41.1	15.4	1	5.0	3.4	6918
Total	4.1	15.2	40.1	16.6	15.8	5.8	2.3	43647

income is somewhat difficult to interpret (see Table 14). There are declines over time for each of the categories under $11,999 and increases for each of the categories over $12,000. Whether these trends are merely commensurate with the severe rate of inflation over this period or whether they reflect actual structural changes in the population cannot be inferred from the data. It seems safe to assume a high degree of error in the measurement of this variable, and the high rate of nonresponse is disturbing.

There seems to be little systematic change in the racial composition of the sample over the six years (see Table 15). Again, though, there is no assurance that the testees of a given racial category in a given year are as representative of their cohort as are the testees of any other year. In addition, the overall response rate to this question was a distressingly low 85.3 percent.

The measure of the size of the student's high school graduating class shows little trend (see Table 16). There may be some movement away from small high schools.

The data for the three-year variables (see Tables 17 to 21) show a slight trend away from testees from small towns and rural settings, and some increase in the proportion of testees from large towns and small cities. There are no striking changes in family size (at least as it is measured here). There is a marked movement away from students planning on attending two-year public community or junior colleges, which involves the same ambiguous interpretation as the aforementioned trend in educational plans. This may also be reflected in what appears to be a trend away from small colleges and toward medium-sized colleges.

Table 14. Changes in Parental Income Distribution of ACT Testees, 1970 to 1975

	Parental Income[a]									
Year	<3,000	3,000-5,999	6,000-7,499	7,500-8,999	9,000-11,999	12,000-14,999	15,000-19,999	20,000+	Missing	N
1970	3.0	5.8	10.6	12.3	19.1	8.2	3.5	2.9	34.6	8033
1971	3.5	7.8	6.6	6.9	11.7	14.1	14.0	19.5	36.9	6774
1972	3.7	6.8	5.8	6.7	12.5	14.3	13.1	15.4	35.1	7375
1973	4.1	7.0	6.0	7.3	14.3	12.2	9.6	10.3	29.2	7403
1974	3.2	6.0	4.3	5.2	13.8	11.5	8.3	8.2	26.0	7144
1975	3.4	4.7	3.5	4.8	13.4	9.9	7.2	7.7	24.3	6918
Total	3.5	6.3	6.2	7.3	14.2	11.6	9.2	10.5	31.1	43747

[a]For 1970 the response categories were:

<3,000
3,000-4,999
5,000-7,499
7,500-9,999
10,000-1,499
15,000-19,999
20,000-24,999
25,000+
Missing

Table 15. Changes in Racial Composition of ACT Testees, 1970 to 1975

Year	Race						
	Black	American Indian	White	Spanish American	Oriental American	Other, Missing	N
1970	5.5	0.8	75.4	2.4	1.7	14.2	8033
1971	7.0	1.1	78.1	2.1	1.4	10.3	6774
1972	6.3	1.1	76.6	2.1	1.2	12.7	7375
1973	6.7	2.4	68.7	2.7	0.6	18.9	7403
1974	6.5	1.1	72.8	2.3	0.6	16.7	7144
1975	6.9	1.4	73.5	2.2	0.6	15.4	6918
Total	6.4	1.3	74.2	2.3	1.0	14.7	43647

Table 16. Distribution of High School Size of ACT Testees, 1970 to 1975 (Based on Number of People in Graduating Class)

Year	High School Size					
	<25	25-99	100-399	400+	Missing	N
1970	3.4	18.0	43.8	33.6	1.2	8033
1971	3.6	18.7	43.1	34.0	1.1	6774
1972	3.6	18.2	44.2	33.0	1.0	7875
1973	3.0	17.5	44.7	34.0	0.6	7403
1974	2.8	17.1	44.0	33.1	3.1	7144
1975	2.6	16.7	45.7	32.7	2.3	6918
Total	3.1	17.7	44.2	33.4	1.5	43647

Table 17. Distribution of Size of Community of ACT Testees, 1973 to 1975

Year	Farm or Open Country	Community Size <500	500-1,999	2,000-9,999	10,000-49,999	50,000-249,999	250,000-499,999	500,000-999,999	1,000,000+	Missing	N
1973	14.2	4.8	8.6	15.9	23.6	13.5	6.7	5.4	5.7	1.6	7403
1974	13.8	3.0	7.0	16.6	23.7	14.7	5.8	5.6	5.7	4.1	7144
1975	12.7	3.1	7.2	16.6	25.5	14.8	5.6	5.4	5.7	3.4	6918
Total	13.6	3.7	7.6	16.4	24.3	14.3	6.1	5.5	5.7	3.0	21465

Table 18. Changes in Number of Siblings of ACT Testees, 1973 to 1975[a]

	Sibs										
Year	0	1	2	3	4	5	6	7	8	9+	N
1973	19.0	24.7	22.3	16.0	8.4	4.4	2.3	1.4	0.8	0.7	7403
1974	20.1	26.5	22.8	14.7	8.2	3.7	2.0	1.1	0.5	0.4	7144
1975	18.3	26.4	23.9	15.4	7.7	4.2	2.1	1.1	0.5	0.5	6918
Total	19.1	25.8	23.0	15.3	8.1	4.1	2.1	1.2	0.6	0.5	21465

[a]Based on the question, "How many brothers and sisters under 21 years of age do you have?"

Table 19. Distribution of Type of College to be Attended by ACT Testees, 1973 to 1975

Year	College Type							
	4-year Public	4-year Private	2-year Public	2-year Private	Vocational/ Technical	School of Nursing	Missing	N
1973	59.0	12.8	18.3	1.5	4.2	2.8	1.5	7403
1974	60.1	12.4	16.7	1.2	3.5	2.6	3.5	7144
1975	62.3	13.5	13.9	1.1	4.2	2.2	2.7	6918
Total	60.4	12.9	16.3	1.3	4.0	2.5	2.5	21465

Table 20. Distribution of Size of College to be Attended by ACT Testees, 1973 to 1975

	College Size					
Year	<1,000	1,000-5,000	5,000-10,000	10,000+	Missing	N
1973	8.3	45.9	27.6	13.4	4.7	7403
1974	7.5	43.5	24.5	18.0	6.4	7144
1975	6.6	49.6	26.4	13.1	4.3	6918
Total	7.5	46.3	26.2	14.9	5.2	21465

Table 21. Distribution of High School Type of ACT Testees, 1973 to 1975

	High School Type							
	Public	Catholic	Private Independent	Private Denominational	Military	Other	Missing	N
1973	87.4	7.8	2.3	1.5	0.2	0.6	0.2	7403
1974	84.8	8.1	2.5	1.6	0.2	0.5	2.2	7144
1975	85.8	8.2	2.7	1.6	0.2	0.3	1.2	6918
Total	86.0	8.1	2.5	1.6	0.2	0.5	1.2	21465

The proportion of students from any particular type of high school has been relatively constant.

Table 22 shows the surprising result that the proportion of testees reporting themselves to be in the top quarter of their high school class actually increased from 1973 to 1975. There has been a small decline in the proportion reporting themselves as being in the second quartile, a more substantial decline in the third quartile, and a steady decline in the bottom quartile.

This does not support the idea that there is an increasing proportion of students from the lower achieving strata of the high school taking the tests. If anything, the results point to an increased proportion of more talented testees. One does not have to believe this result, and can argue instead that students do not accurately report (or even know) their class rank. Certainly there are social and psychological reasons for not placing oneself in the bottom category. While Maxey and Ormsby (1971) have demonstrated that students generally report their high school grades with a high degree of accuracy, it may be wise to remain skeptical about the apparently increasing proportion of testees from the upper strata of their high school classes.

Table 23 shows steady declines in the proportion of high school grade point averages below 2.5 from 1970 to 1975. There is some increase in the proportion of grades in the 2.51 to 3.00 range, and marked increases in grades above 3.00. It is not clear whether this represents a general grade inflation or an increase in the proportion of testees from the upper levels of their high school classes, but

Table 22. Distribution of High School Rank of ACT Testees, 1973 to 1975

Year	Rank					
	Top Quarter	2nd Quarter	3rd Quarter	4th Quarter	Missing	N
1973	37.7	40.1	19.2	2.1	0.9	7403
1974	40.5	37.8	16.1	1.8	3.8	7144
1975	42.0	38.6	14.6	1.6	3.1	6918
Total	40.0	38.9	16.7	1.9	2.5	21465

Table 23. Distribution of High School Grade Average of ACT Testees, 1970 to 1975

Year	Grade Point Average .0-0.5	0.51-1.00	1.01-1.50	1.51-2.00	2.01-2.50	2.51-3.00	3.01-3.50	3.51-4.00	N
1970	1.8	1.2	4.3	18.3	22.8	26.3	15.5	9.8	8033
1971	2.0	0.8	4.2	17.0	21.4	27.0	16.3	11.3	6774
1972	2.3	0.6	2.8	14.1	22.2	26.3	18.6	13.0	7375
1973	2.1	0.6	2.3	12.4	20.4	28.4	18.7	15.0	7403
1974	3.2	0.6	2.4	10.7	18.5	28.0	20.2	16.4	7144
1975	2.9	0.5	2.3	9.8	17.4	27.4	21.8	18.0	6918
Total	2.4	0.7	3.1	13.8	20.5	27.2	18.5	13.8	43647

again the data do not support the conclusion that an increasing proportion of ACT-testees are from the lower end of the high school achievement distribution.

The proportion of students in any given high school curriculum has changed little over the last years (see Table 24). It has been observed that students are often unable to state accurately what curriculum they are in (William H. Sewell, personal communication) but there is no way to test whether this bias is operating any more in one year than another.

Tables 25 to 30 show patterns of course-taking for the last three years. The major features of these tables are: There have been some increases in the proportion of students who have taken eight semesters of Natural Science and Math. There seem to be declining enrollments in language courses. The patterns of enrollments are fairly stable elsewhere in tables.[13]

What does this series of tables show? When course-taking increases (as in the case of Natural Science), test scores remain stable. When course-taking in a particular subject remains stable, test scores most related to that subject decline. Without trivializing the issue, this suggests that "it takes all the running you can do, to keep in the same place." That is, perhaps if the pattern of course-taking in Natural Science had paralleled that of other subjects, then Natural Science scores would have shown similar declines.

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[13] These findings are somewhat at variance with those of Gertler and Barker reported earlier, which were of course for a more general population of students than the present sample.

Table 24. Distribution of High School Curriculum of ACT Testees, 1973 to 1975

	Curriculum					
Year	Business/ Commercial	Vocational/ Occupational	College Prep	Other/ General	Missing	N
1973	9.3	10.5	56.7	22.9	0.6	7403
1974	6.7	8.4	57.8	23.7	3.3	7144
1975	7.2	9.3	57.5	23.6	2.4	6918
Total	7.8	9.4	57.4	23.4	2.1	21465

Table 25. Changes in Enrollments in High School English of ACT Testees, 1973 to 1975

	Semesters of English										
Year	None	1	2	3	4	5	6	7	8	Missing	N
1973	0.1	0.2	0.4	0.7	2.0	0.9	12.8	5.7	76.9	0.3	7403
1974	0.1	0.3	0.3	0.5	2.2	0.9	13.3	5.4	74.7	2.3	7144
1975	0.0	0.1	0.3	0.5	2.2	0.9	11.8	5.9	77.1	1.2	6918
Total	0.1	0.2	0.3	0.6	2.1	0.9	12.7	5.7	76.2	1.3	21465

Table 26. Changes in Enrollments in High School Math of ACT Testees, 1973 to 1975

	Semesters of Math										
Year	None	1	2	3	4	5	6	7	8	Missing	N
1973	0.2	0.6	7.6	2.6	26.7	3.4	28.2	3.5	26.8	0.5	7403
1974	0.3	0.6	7.3	2.5	25.5	3.1	27.1	3.7	27.6	2.3	7144
1975	0.2	0.5	7.5	2.1	25.2	3.3	26.1	3.2	30.6	1.3	6918
Total	0.2	0.6	7.5	2.4	25.8	3.2	27.2	3.5	28.3	1.4	21465

Table 27. Changes in Enrollments in High School Social Studies of ACT Testees, 1973 to 1975

Year	Semesters of Social Studies										
	None	1	2	3	4	5	6	7	8	Missing	N
1973	0.2	0.6	4.4	3.0	20.0	6.2	32.2	6.1	26.2	1.1	7403
1974	0.1	0.3	3.4	3.0	20.0	6.9	32.7	6.0	24.9	2.7	7144
1975	0.1	0.3	3.8	2.9	21.7	6.3	32.9	6.0	24.2	1.7	6918
Total	0.2	0.4	3.9	3.0	20.5	6.5	32.6	6.0	25.1	1.8	21465

Table 28. Changes in Enrollments in High School Natural Science of ACT Testees, 1973 to 1975

	Semesters of Natural Science										
Year	None	1	2	3	4	5	6	7	8	Missing	N
1973	2.9	1.8	16.8	2.8	31.4	2.2	23.1	1.7	16.0	1.2	7403
1974	2.3	1.3	17.9	2.7	30.4	2.3	21.2	1.7	17.3	2.8	7144
1975	2.0	1.5	16.8	2.5	29.3	2.5	22.4	2.1	18.6	1.9	6918
Total	2.4	1.5	17.2	2.7	30.6	2.3	22.2	1.8	17.3	1.9	21465

Table 29. Changes in Enrollments in High School Business Courses of ACT Testees, 1973 to 1975

	Semesters of Business										
Year	None	1	2	3	4	5	6	7	8	Missing	N
1973	34.0	10.1	23.8	3.8	14.2	1.7	5.8	0.8	3.3	2.8	7403
1974	31.3	9.5	23.9	4.0	14.9	1.8	6.2	0.9	3.7	3.8	7144
1975	30.3	9.5	23.6	4.9	14.9	1.7	7.1	0.9	3.9	3.1	6918
Total	31.9	9.7	23.6	4.2	14.7	1.7	6.4	0.9	3.6	3.2	21465

Table 30. Changes in Enrollments in High School Vocational Courses of ACT Testees, 1973 to 1975

	Vocational Courses										
Year	None	1	2	3	4	5	6	7	8	Missing	N
1973	53.2	5.6	14.6	2.1	9.6	0.9	4.6	0.7	5.4	3.2	7403
1974	52.6	5.1	14.0	2.1	8.9	1.2	4.3	0.8	6.6	4.4	7144
1975	51.8	5.0	14.6	2.3	10.0	1.0	5.2	0.7	5.8	3.7	6918
Total	52.5	5.3	14.4	2.2	9.5	1.0	4.7	0.7	5.9	3.8	21465

Trends in Test Scores by Sex

To return now to the trends of means and standard deviations over time, one first notices that there are marked sex differences in these trends. Table 31 shows that while women continue to score above men on the English exam, the score declines are more precipitous for women. Male scores consistently show slightly more variation than do female scores.

Math scores have declined far more for women than for men. Again, there is more variation in male scores. A similar pattern exists for the mean of Social Studies scores, although here the standard deviations are more comparable for each sex.

There have been no obvious trends in either means or standard deviations for Natural Science scores. Male means are both higher and more variable than those of women.

Finally, the table shows that the declines on Composite scores have been far steeper over time for women than for men. This implies that the gap between male and female scores is increasing. Male standard deviations are considerably above female standard deviations, and the standard deviations are steadily increasing for each sex.

It is striking that male standard deviations are consistently higher than those of female testees, even in years when women constitute the majority of the test-taking population. The general increase in standard deviations probably does indicate an increasingly heterogeneous group of testees, but the differential between men and women may have as much to do with the actual sex-related processes of learning in the high school[14] (for example, tracking and teacher

[14] There is a growing literature on this topic. See Rosenbaum (1976); Alexander and Eckland (1974); and Stacey, Bereaud, and Daniels (1974).

Table 31. Means and Standard Deviations of ACT Test Scores by Sex, 1970 to 1975

Year	English		Math		Social Studies		Natural Science		Composite		N
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	
1970	17.03	19.08	20.14	18.04	19.07	18.46	21.28	19.76	19.50	18.95	8033
	(5.52)	(5.37)	(7.17)	(6.98)	(7.12)	(7.02)	(6.45)	(6.08)	(5.66)	(5.45)	
1971	16.89	18.64	20.01	17.67	19.07	18.14	21.56	19.49	19.50	18.61	6774
	(5.57)	(5.35)	(7.28)	(6.94)	(7.21)	(7.12)	(6.54)	(6.21)	(5.75)	(5.45)	
1972	17.53	18.80	20.50	18.02	19.28	17.64	21.99	19.83	19.95	18.70	7375
	(5.23)	(5.20)	(7.16)	(6.81)	(7.42)	(7.42)	(6.50)	(6.03)	(5.73)	(5.51)	
1973	17.12	18.50	19.79	16.96	19.07	17.12	22.20	19.50	19.66	18.14	7403
	(5.17)	(5.09)	(7.42)	(7.11)	(7.59)	(7.55)	(6.45)	(5.94)	(5.78)	(5.52)	
1974	17.06	18.30	19.00	16.33	18.62	16.25	22.32	19.92	19.37	17.83	7144
	(5.28)	(5.22)	(7.95)	(7.59)	(7.66)	(7.33)	(6.41)	(5.97)	(5.94)	(5.63)	
1975	16.79	18.00	19.13	16.04	17.97	16.19	22.01	19.86	19.10	17.65	6918
	(5.38)	(5.25)	(7.65)	(7.25)	(7.33)	(7.12)	(6.59)	(6.41)	(5.91)	(5.64)	
Total	17.08	18.56	19.79	17.17	18.87	17.29	21.88	19.73	19.52	18.31	43647
	(5.37)	(5.26)	(7.45)	(7.17)	(7.40)	(7.32)	(6.50)	(6.38)	(5.80)	(5.55)	

expectations) as with problems emanating from the changing pool of testees. Perhaps males are simply more heterogeneous in their academic abilities than are females.

Trends in Test Scores by Race

Table 32 shows the breakdown of ACT scores by race. The table indicates that mean English scores for whites have declined, albeit irregularly, over the last six years. Standard deviations for whites were highest in 1970 and 1971, declined considerably in 1972 and 1973, and increased to a point between these two extremes in 1974 and 1975.

Mean English scores for blacks increased regularly for the first four years of the study, although the scores were almost a full standard deviation below the mean for the entire sample. The scores have since decreased, but the mean for 1975 was still above the 1970 mean. The scores were most variable for the earliest and most recent groups of black testees.

The patterns for other minorities and for those not responding to the race question are mixed. In general, these groups obtain relatively low English scores, but there are no readily apparent trends in means and standard deviations.

Except for 1972, mean Math scores have steadily declined for whites. This is accompanied by increasing variation in the scores, suggesting a more heterogeneous sample of white testees. Black scores have also declined, although these are more homogeneous than white scores (i.e., the standard deviations are lower). The Math scores of other minority groups, with the exception of Oriental Americans, are generally declining.

Table 32a. Means and Standard Deviations of ACT English Scores by Racial Groups, 1970 to 1975

Year	Race							
	Black	American Indian	White	Spanish American	Oriental American	Missing/ Other	Total	N
1970	11.95 (5.21)	14.15 (5.91)	18.97 (5.09)	14.25 (5.75)	15.18 (6.11)	16.80 (5.65)	18.06 (5.55)	8033
1971	12.29 (5.35)	15.73 (6.47)	18.66 (5.10)	14.25 (5.46)	14.99 (5.61)	16.00 (5.57)	17.76 (5.53)	6774
1972	12.73 (4.99)	14.86 (5.38)	19.18 (4.75)	14.41 (5.24)	15.15 (5.50)	16.06 (5.46)	18.18 (5.25)	7375
1973	13.18 (4.80)	15.76 (4.98)	18.76 (4.80)	13.04 (4.87)	15.44 (5.10)	17.03 (5.35)	17.85 (5.18)	7403
1974	12.82 (5.25)	15.63 (5.19)	18.48 (4.97)	14.19 (5.40)	16.64 (5.74)	16.98 (5.21)	17.72 (5.29)	7144
1975	12.16 (5.07)	13.83 (4.74)	18.30 (4.93)	14.36 (5.59)	16.81 (5.50)	16.59 (5.55)	17.45 (5.34)	6918
Total	12.53 (5.13)	15.10 (5.38)	18.74 (4.95)	14.26 (5.34)	15.45 (5.70)	16.66 (5.45)	17.85 (5.36)	43647

Table 32b. Means and Standard Deviations of ACT Math Scores by Racial Groups, 1970 to 1975

Year	Race							
	Black	American Indian	White	Spanish American	Oriental American	Missing/ Other	Total	N
1970	12.38 (5.14)	14.85 (5.94)	19.95 (6.99)	15.19 (6.70)	17.93 (7.24)	18.11 (6.98)	19.09 (7.15)	8033
1971	12.01 (5.59)	15.46 (6.47)	19.82 (6.96)	14.64 (6.19)	17.34 (7.08)	17.42 (7.17)	18.84 (7.21)	6774
1972	12.67 (5.82)	14.43 (6.43)	20.31 (6.77)	14.37 (6.30)	17.96 (7.03)	17.30 (7.08)	19.24 (7.10)	7375
1973	11.67 (6.01)	15.31 (6.38)	19.50 (7.11)	14.25 (6.61)	17.85 (6.46)	17.27 (7.42)	18.31 (7.40)	7403
1974	10.66 (6.49)	14.82 (7.67)	18.69 (7.56)	12.39 (7.79)	19.44 (8.22)	16.18 (7.80)	17.57 (7.87)	7144
1975	10.93 (5.83)	12.55 (7.10)	18.45 (7.38)	14.06 (7.11)	18.05 (7.98)	16.47 (7.49)	17.44 (7.59)	6918
Total	11.72 (5.87)	14.61 (6.72)	19.48 (7.15)	14.17 (6.79)	17.96 (7.24)	17.11 (7.35)	18.43 (7.42)	43647

Table 32c. Means and Standard Deviations of ACT Social Studies Scores by Racial Groups, 1970 to 1975

Year	Race							
	Black	American Indian	White	Spanish American	Oriental American	Missing/ Other	Total	N
1970	11.46 (6.12)	13.11 (7.57)	19.91 (6.60)	15.34 (7.39)	15.07 (7.39)	16.83 (7.18)	18.76 (7.08)	8033
1971	11.18 (6.13)	16.80 (7.89)	19.75 (6.72)	14.56 (7.00)	14.71 (7.53)	16.55 (7.17)	18.61 (7.18)	6774
1972	11.27 (6.23)	12.61 (6.21)	19.78 (6.99)	13.63 (7.26)	14.78 (7.32)	15.54 (7.46)	18.45 (7.47)	7375
1973	11.17 (6.52)	14.91 (7.41)	19.34 (7.18)	13.45 (7.32)	14.88 (6.74)	16.91 (7.82)	18.05 (7.63)	7403
1974	10.15 (6.32)	13.89 (7.41)	18.42 (7.24)	12.96 (7.44)	17.69 (7.94)	16.31 (7.48)	17.35 (7.58)	7144
1975	10.62 (5.81)	12.68 (6.04)	17.95 (7.01)	14.27 (7.43)	16.26 (7.55)	16.13 (7.30)	17.00 (7.27)	6918
Total	10.97 (6.20)	14.11 (7.22)	19.22 (6.99)	14.04 (7.32)	15.29 (7.43)	16.42 (7.43)	18.05 (7.40)	43647

Table 32d. Means and Standard Deviations of ACT Natural Science Scores by Racial Groups, 1970 to 1975

Year	Race							
	Black	American Indian	White	Spanish American	Oriental American	Missing/ Other	Total	N
1970	14.23 (4.79)	16.32 (6.43)	21.46 (6.03)	16.75 (6.26)	18.39 (6.68)	19.06 (6.20)	20.52 (6.31)	8033
1971	13.92 (5.16)	18.18 (7.24)	21.56 (6.11)	16.18 (5.83)	17.57 (5.72)	18.71 (6.31)	20.52 (6.46)	6774
1972	14.46 (4.84)	16.53 (5.26)	21.97 (6.03)	16.49 (5.44)	18.71 (6.05)	18.81 (6.27)	20.89 (6.36)	7375
1973	14.98 (4.88)	17.69 (5.44)	21.83 (6.07)	16.75 (5.35)	20.10 (5.25)	20.02 (6.42)	20.79 (6.33)	7403
1974	14.68 (4.88)	18.60 (6.11)	21.99 (6.03)	17.09 (6.18)	21.16 (6.81)	20.04 (6.08)	21.03 (6.29)	7144
1975	14.75 (5.41)	17.26 (5.42)	21.74 (6.21)	17.68 (6.70)	19.31 (7.51)	20.08 (6.64)	20.84 (6.53)	6918
Total	14.51 (5.01)	17.50 (5.90)	21.75 (6.08)	16.83 (5.95)	18.82 (6.38)	19.54 (6.32)	20.76 (6.38)	43647

Table 32e. Means and Standard Deviations of ACT Composite Scores by Racial Groups, 1970 to 1975

Year	Race							
	Black	American Indian	White	Spanish American	Oriental American	Missing/ Other	Total	N
1970	12.63 (4.16)	14.74 (5.33)	20.19 (5.17)	15.47 (5.46)	16.77 (6.02)	17.82 (5.48)	19.23 (5.56)	8033
1971	12.46 (4.51)	16.62 (6.09)	20.07 (5.19)	15.07 (5.30)	16.25 (5.59)	17.29 (5.41)	19.06 (5.62)	6774
1972	12.91 (4.43)	14.75 (4.87)	20.44 (5.20)	14.86 (5.12)	16.74 (5.46)	17.05 (5.61)	19.31 (5.66)	7375
1973	12.84 (4.52)	16.04 (5.00)	19.98 (5.28)	14.75 (5.09)	17.19 (5.09)	17.92 (5.81)	18.86 (5.70)	7403
1974	12.24 (4.70)	15.87 (5.63)	19.52 (5.47)	14.26 (5.73)	18.91 (6.34)	17.50 (5.67)	18.55 (5.83)	7144
1975	12.24 (4.64)	14.18 (4.85)	19.23 (5.45)	15.20 (6.05)	17.69 (6.20)	17.44 (5.85)	18.30 (5.81)	6918
Total	12.55 (4.50)	15.45 (5.28)	19.92 (5.31)	14.94 (5.45)	17.00 (5.80)	17.55 (5.66)	18.90 (5.71)	43647

While the pattern is less clear for some groups than for others, mean Social Studies scores seem to be dropping across the board. The trend in standard deviations is not really clear, but there appears to be a general rise.

The salient feature of the breakdown of Natural Science scores is stability. Some racial groups display fairly erratic patterns, but these are groups with more limited sample sizes (e.g., American Indians and Oriental Americans).

Composite scores for whites have declined steadily from year to year (again with the exception of 1972), while the standard deviations have concurrently risen. Scores for blacks have been less consistent, but the two most recent cohorts have shown the lowest means and lowest standard deviations. Except for Oriental Americans, where the two most recent cohorts have been the highest achieving, the remaining minority groups have performed most poorly in the last two years.

These results do not suggest that changes in the performance of minorities substantially accounts for the general decline in test scores. Indeed, the greatest declines for any particular racial group on the English, Social Studies, and Composite scores have been for whites, and the declines for whites on the Math exam have been nearly as large as for any other group.[15] In sum, given the stability in the year-to-year racial composition of the test-taking population, there is no justification for attributing the score decline to the changing performance of minority students.

[15] The result is the same whether the declines are measured in absolute amounts or as proportions of standard deviations for both the white and black distributions.

Trends in Test Scores by Parental Income

Perhaps test scores have declined disproportionately at certain levels of parental income. Table 33 speaks to this question. ACT English scores increase monotonically with each increasing income level, but the extent of the declines are particularly marked for students in the lower categories. The data suggest a similar conclusion for Math and Social Studies scores, and the pattern is particularly evident in the Composite scores. Testees for each succeeding level of parental income score higher than those in the next lower level, but the greatest score declines over time generally occur in the lowest income categories (except, of course, for Natual Science scores).

As indicated earlier, these results should be treated with caution. The income categories are crude, the validity of this kind of student-reported parental income is questionable, and the meaning of the categories has been obscured by the severe rate of inflation that has occurred over this period of time. A student in the $3,000 to $5,999 category in 1975 is clearly less well off economically than a student in the same category in 1970. If we can draw any conclusions from these results, it is probably that there is little convincing evidence for attributing the general decline to an influx of low-income students.

Trends in Test Scores by Educational Plans

Table 34 presents data pertaining to the question of whether the score decline may be partly attributable to the differential performance of students with varying levels of educational plans. The table shows that the steepest declines in English scores are for those

Table 33a. Means and Standard Deviations of ACT English Scores by Parental Income Level of ACT Testees, 1970 to 1975

	Parental Income									
Year	<3,000	3,000-5,999	6,000-7,499	7,500-8,999	9,000-11,999	12,000-14,999	15,000-19,999	20,000+	Missing	N
1970	14.20 (6.26)	15.75 (5.97)	17.11 (5.68)	18.19 (5.20)	18.50 (5.21)	18.36 (5.46)	19.00 (5.17)	18.53 (5.28)	18.57 (5.47)	8033
1971	13.83 (6.20)	15.63 (5.80)	17.37 (5.30)	17.43 (5.62)	18.44 (5.18)	18.18 (5.33)	18.46 (5.17)	19.18 (5.09)	17.94 (5.47)	6774
1972	13.94 (5.51)	15.81 (5.52)	17.26 (5.51)	17.78 (5.05)	18.49 (4.89)	18.63 (4.84)	18.85 (5.01)	19.72 (4.73)	18.53 (5.22)	7375
1973	13.89 (5.34)	16.09 (5.39)	16.84 (5.08)	17.22 (5.09)	18.42 (4.80)	18.68 (4.82)	18.69 (4.99)	19.11 (4.98)	17.84 (5.15)	7403
1974	13.29 (5.44)	15.61 (5.78)	16.62 (5.60)	16.57 (5.48)	17.82 (5.20)	18.29 (4.96)	18.51 (4.79)	19.20 (4.89)	17.53 (5.17)	7144
1975	12.64 (5.37)	14.46 (5.37)	15.62 (5.51)	16.22 (5.59)	17.68 (5.10)	18.02 (5.00)	18.06 (5.08)	19.02 (4.97)	17.17 (5.22)	6918
Total	13.65 (5.70)	15.63 (5.66)	16.95 (5.49)	17.46 (5.34)	18.27 (5.08)	18.36 (5.04)	18.51 (5.01)	19.16 (4.96)	18.01 (5.33)	43647

Table 33b. Means and Standard Deviations of ACT Math Scores by Parental Income Level of ACT Testees, 1970 to 1975

Year	Parental Income									
	<3,000	3,000-5,999	6,000-7,499	7,500-8,999	9,000-11,999	12,000-14,999	15,000-19,999	20,000+	Missing	N
1970	14.52 (6.26)	16.49 (6.81)	18.00 (6.81)	[illegible]	20.42 (6.95)	19.88 (6.75)	20.27 (6.99)	20.28 (7.02)	18.91 (7.31)	8033
1971	14.38 (6.59)	16.31 (6.99)	18.02 (7.15)	18.76 (7.22)	19.98 (7.11)	20.18 (6.75)	20.75 (6.61)	21.02 (7.31)	18.36 (7.12)	6774
1972	13.67 (6.65)	16.56 (7.20)	18.06 (7.00)	19.03 (6.77)	20.09 (6.94)	20.23 (6.84)	20.77 (6.73)	21.64 (6.68)	18.98 (7.00)	7375
1973	12.92 (6.77)	15.58 (7.00)	16.56 (6.93)	17.61 (7.08)	18.98 (7.22)	20.01 (6.95)	19.99 (7.11)	20.50 (7.11)	17.88 (7.49)	7403
1974	11.65 (7.27)	13.82 (7.93)	15.55 (7.67)	16.38 (7.94)	18.05 (7.73)	18.9[illegible] (7.52)	18.90 (7.35)	19.95 (7.6[illegible])	16.94 (7.67)	7144
1975	11.84 (6.68)	13.32 (6.94)	15.72 (7.45)	16.30 (7.34)	17.09 (7.45)	18.14 (7.58)	18.38 (7.52)	19.93 (7.38)	16.72 (7.20)	6918
Total	13.18 (6.79)	15.53 (7.25)	17.30 (7.14)	18.33 (7.28)	19.28 (7.29)	19.38 (7.17)	19.57 (7.20)	20.40 (7.32)	18.12 (7.35)	43647

Table 33c. Means and Standard Deviations of ACT Social Studies Scores by Parental Income Level of ACT Testees, 1970 to 1975

Year	Parental Income									
	<3,000	3,000-5,999	6,000-7,499	7,500-8,999	9,000-11,999	12,000-14,999	15,000-19,999	20,000+	Missing	N
1970	13.91 (7.33)	16.18 (7.37)	18.16 (6.97)	19.27 (6.85)	19.89 (6.66)	19.40 (6.8[illegible])	20.18 (6.55)	19.71 (7.18)	18.62 (7.10)	8033
1971	14.01 (7.32)	16.20 (7.38)	17.69 (7.04)	18.82 (7.00)	20.07 (6.78)	19.7[illegible] (6.[illegible]4)	20.09 (6.58)	20.64 (6.72)	18.12 (7.22)	6774
1972	13.31 (7.08)	15.68 (7.48)	17.39 (7.68)	18.38 (7.38)	19.05 (7.28)	19.[illegible] (7.0[illegible])	19.97 (6.79)	20.71 (7.03)	18.21 (7.49)	7375
1973	12.92 (7.95)	15.58 (7.73)	16.95 (7.13)	17.42 (7.52)	18.71 (7.27)	[illegible] (7.37)	19.44 (7.13)	19.96 (7.33)	17.61 (7.65)	7403
1974	11.80 (7.04)	14.22 (8.05)	15.24 (7.43)	15.93 (7.36)	17.65 (7.26)	18.31 (7.44)	18.56 (7.04)	19.53 (7.23)	16.81 (7.50)	7144
1975	11.63 (6.41)	13.28 (7.32)	15.10 (7.04)	16.25 (7.25)	17.14 (7.16)	17.65 (6.97)	17.94 (7.07)	19.04 (7.06)	16.25 (7.08)	6918
Total	12.95 (7.28)	15.34 (7.62)	17.16 (7.26)	18.05 (7.27)	18.90 (7.11)	18.96 (7.14)	19.08 (6.99)	19.75 (7.13)	17.75 (7.40)	43647

Table 33d. Means and Standard Deviations of ACT Natural Science Scores by Parental Income Level of ACT Testees, 1970 to 1975

Year	Parental Income									
	<3,000	3,000-5,999	6,000-7,499	7,500-8,999	9,000-11,999	12,000-14,999	15,000-19,999	20,000+	Missing	N
1970	16.35 (6.23)	18.16 (6.40)	19.95 (6.06)	20.88 (6.13)	21.62 (6.11)	21.12 (6.16)	21.35 (6.19)	21.04 (6.31)	20.43 (6.31)	8033
1971	16.44 (6.45)	17.98 (6.49)	19.70 (6.50)	20.81 (6.22)	21.86 (6.15)	21.52 (6.40)	21.79 (6.09)	22.00 (6.32)	20.24 (6.33)	6774
1972	16.63 (6.20)	18.36 (6.24)	20.01 (6.28)	20.63 (6.14)	21.43 (6.20)	21.97 (6.07)	21.81 (6.18)	22.97 (6.17)	20.75 (6.29)	7375
1973	16.33 (5.99)	18.66 (6.16)	19.68 (5.90)	20.24 (6.30)	21.30 (6.21)	21.96 (6.16)	21.90 (6.08)	22.44 (6.08)	20.59 (6.31)	7403
1974	16.53 (5.81)	18.42 (6.60)	19.30 (6.22)	20.04 (6.26)	21.18 (6.14)	21.68 (6.04)	22.14 (5.83)	22.80 (6.14)	20.64 (6.20)	7144
1975	15.39 (6.00)	17.40 (6.56)	18.90 (6.55)	19.94 (6.55)	20.95 (6.39)	21.52 (6.17)	21.48 (6.34)	22.82 (6.30)	20.31 (6.30)	6918
Total	16.29 (6.12)	18.21 (6.40)	19.71 (6.21)	20.53 (6.24)	21.42 (6.19)	21.65 (6.16)	21.79 (6.11)	22.59 (6.23)	20.50 (6.30)	43647

Table 33e. Means and Standard Deviations of ACT Composite Scores by Parental Income Level of ACT Testees, 1970 to 1975

Year	Parental Income									
	<3,000	3,000-5,999	6,000-7,499	7,500-8,999	9,000-11,999	12,000-14,999	15,000-19,999	20,000+	Missing	N
1970	14.88 (5.56)	16.78 (5.68)	18.41 (5.42)	19.61 (5.32)	20.22 (5.27)	19.82 (5.29)	20.32 (5.24)	20.00 (5.49)	19.26 (5.58)	8033
1971	14.78 (5.71)	16.67 (5.75)	18.33 (5.42)	19.06 (5.55)	20.21 (5.29)	20.02 (5.29)	20.39 (5.11)	20.82 (5.30)	18.79 (5.56)	6774
1972	14.48 (5.46)	16.73 (5.78)	18.28 (5.75)	19.09 (5.46)	19.90 (5.38)	20.22 (5.28)	20.47 (5.23)	21.40 (5.21)	19.25 (5.60)	7375
1973	14.12 (5.65)	16.58 (5.59)	17.63 (5.25)	18.25 (5.55)	19.47 (5.33)	20.19 (5.34)	20.11 (5.36)	20.60 (5.47)	18.60 (5.70)	7375
1974	13.43 (5.44)	15.66 (6.14)	16.82 (5.87)	17.38 (5.81)	18.82 (5.55)	19.30 (5.50)	19.64 (5.22)	20.49 (5.58)	18.10 (5.71)	7144
1976	12.99 (5.27)	14.72 (5.77)	16.45 (5.80)	17.31 (5.80)	18.34 (5.68)	18.96 (5.51)	19.08 (5.60)	20.33 (5.49)	17.74 (5.51)	6918
Total	14.13 (5.55)	16.30 (5.81)	17.90 (5.57)	18.72 (5.58)	19.59 (5.44)	19.71 (5.40)	19.86 (5.35)	20.59 (5.46)	18.72 (5.65)	43647

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Table 34a. Means and Standard Deviations of ACT English Scores by Degree Aspirations of ACT Testees, 1970 to 1975

Year	Educational Plans								
	High School Diploma	Vocational, Technical	2-year Degree	Bachelor's Degree	Master's Degree	Professional Degree	Other	Total	N
1970	14.97 (5.69)	15.82 (5.29)	15.90 (5.43)	18.68 (5.24)	19.36 (5.35)	19.05 (5.58)	16.06 (5.56)	18.06 (5.55)	8033
1971	14.62 (5.98)	15.89 (5.40)	15.84 (5.39)	18.23 (5.16)	18.77 (5.53)	19.10 (5.54)	16.04 (5.73)	17.76 (5.53)	6774
1972	15.73 (5.90)	16.34 (4.99)	16.33 (4.99)	18.49 (5.06)	19.55 (5.15)	19.36 (5.10)	16.41 (5.25)	18.18 (5.25)	7875
1973	17.41 (4.90)	16.47 (4.60)	15.69 (4.96)	18.11 (5.05)	19.39 (5.11)	18.66 (5.16)	16.59 (4.90)	17.85 (5.18)	7403
1974	16.17 (5.63)	15.92 (5.09)	15.91 (4.94)	17.87 (5.19)	19.01 (5.11)	18.96 (5.21)	15.97 (5.05)	17.72 (5.29)	7144
1975	16.03 (5.48)	15.17 (5.00)	15.37 (5.11)	17.49 (5.15)	19.02 (5.22)	18.84 (5.17)	15.40 (5.35)	17.45 (5.34)	6918
Total	15.80 (5.67)	15.95 (5.08)	15.86 (5.15)	18.16 (5.16)	19.20 (5.26)	18.98 (5.28)	16.11 (5.31)	17.85 (5.36)	43647

Table 34b. Means and Standard Deviations of ACT Math Scores by Degree Aspirations of ACT Testees, 1970 to 1975

Year	Educational Plans								
	High School Diploma	Vocational, Technical	2-year Degree	Bachelor's Degree	Master's Degree	Professional Degree	Other	Total	N
1970	15.25 (6.26)	15.71 (5.95)	15.26 (6.03)	19.65 (6.89)	21.43 (7.06)	21.55 (7.16)	16.67 (6.76)	19.09 (7.15)	8033
1971	16.39 (6.89)	15.40 (6.32)	15.07 (6.05)	19.36 (6.79)	20.67 (7.30)	21.62 (7.25)	16.79 (7.21)	18.84 (7.21)	6774
1972	16.59 (6.70)	16.08 (6.23)	15.59 (6.18)	19.64 (6.78)	21.49 (7.03)	21.70 (6.99)	16.98 (6.75)	19.24 (7.10)	7375
1973	17.78 (7.21)	15.41 (6.80)	14.69 (6.61)	18.53 (7.04)	20.81 (7.40)	20.90 (7.43)	15.75 (6.65)	18.31 (7.40)	7403
1974	15.56 (7.54)	13.55 (7.05)	13.76 (6.95)	17.81 (7.53)	19.61 (7.94)	20.40 (7.76)	14.73 (7.52)	17.57 (7.87)	7144
1975	16.44 (7.47)	13.49 (6.39)	13.56 (6.98)	17.27 (7.32)	19.89 (7.58)	20.42 (7.37)	14.62 (6.86)	17.44 (7.59)	6918
Total	16.11 (7.14)	15.03 (6.51)	14.71 (6.40)	18.73 (7.12)	20.72 (7.39)	20.97 (7.34)	16.01 (6.94)	18.43 (7.42)	43647

Table 34c. Means and Standard Deviations of ACT Social Studies Scores by Degree Aspirations of ACT Testees, 1970 to 1975

Year	Educational Plans								
	High School Diploma	Vocational, Technical	2-year Degree	Bachelor's Degree	Master's Degree	Professional Degree	Other	Total	N
1970	15.31 (7.10)	15.48 (6.77)	15.35 (6.63)	19.39 (6.63)	20.91 (6.70)	21.09 (7.14)	15.52 (6.68)	18.76 (7.08)	8033
1971	15.05 (7.07)	15.59 (6.87)	15.48 (6.68)	19.08 (6.72)	20.24 (7.07)	21.33 (7.04)	15.89 (7.30)	18.61 (7.18)	6774
1972	15.14 (7.74)	15.35 (6.87)	14.82 (6.89)	18.79 (7.15)	20.82 (7.19)	21.10 (7.10)	15.87 (6.99)	18.49 (7.47)	7375
1973	16.32 (7.98)	14.90 (6.94)	14.14 (6.98)	18.55 (7.31)	20.74 (7.15)	19.94 (7.65)	15.21 (7.19)	18.05 (7.63)	7403
1974	15.23 (7.84)	13.73 (6.88)	14.02 (6.82)	17.37 (7.30)	19.73 (7.28)	19.99 (7.56)	14.48 (6.99)	17.35 (7.58)	7144
1975	15.18 (7.12)	13.11 (6.15)	13.39 (6.34)	16.84 (6.93)	19.26 (7.10)	19.52 (7.19)	14.03 (6.77)	17.00 (7.27)	6918
Total	15.26 (7.46)	14.78 (6.81)	14.59 (6.78)	18.35 (7.07)	20.41 (7.08)	20.42 (7.30)	15.22 (6.98)	18.05 (7.40)	43647

Table 34d. Means and Standard Deviations of ACT Natural Science Scores by Degree Aspirations of ACT Testees, 1970 to 1975

Year	Educational Plans								
	High School Diploma	Vocational, Technical	2-year Degree	Bachelor's Degree	Master's Degree	Professional Degree	Other	Total	N
1970	17.66 (6.53)	17.84 (5.58)	17.49 (5.52)	20.91 (5.93)	22.35 (6.28)	22.98 (6.41)	17.92 (6.05)	20.52 (6.31)	8033
1971	16.76 (6.08)	18.16 (5.74)	17.88 (5.70)	20.89 (6.07)	21.82 (6.67)	22.88 (6.75)	18.62 (6.13)	20.52 (6.46)	6774
1972	18.46 (6.67)	18.73 (5.64)	17.99 (5.64)	21.01 (6.10)	22.84 (6.36)	23.23 (6.47)	18.88 (5.78)	20.89 (6.36)	7375
1973	19.63 (5.90)	18.52 (5.87)	17.81 (5.35)	20.94 (6.07)	22.85 (6.34)	22.74 (6.49)	18.46 (5.89)	20.79 (6.33)	7403
1974	19.24 (6.49)	18.47 (5.58)	18.32 (5.40)	21.02 (6.10)	22.77 (6.11)	23.93 (6.45)	18.58 (5.72)	21.03 (6.29)	7144
1975	19.31 (6.57)	17.30 (5.44)	17.53 (5.82)	20.73 (6.21)	23.07 (6.36)	23.29 (6.43)	18.20 (6.03)	20.84 (6.53)	6918
Total	18.65 (6.51)	18.18 (5.66)	17.83 (5.57)	20.92 (6.07)	22.59 (6.37)	23.09 (6.49)	18.43 (5.94)	20.76 (6.38)	43647

Table 34e. Means and Standard Deviations of ACT Composite Scores by Degree Aspirations of ACT Testees, 1970 to 1975

Year	Educational Plans								
	High School Diploma	Vocational, Technical	2-year Degree	Bachelor's Degree	Master's Degree	Professional Degree	Other	Total	N
1970	15.90 (5.36)	16.33 (4.71)	16.12 (4.76)	19.78 (5.15)	21.14 (5.41)	21.28 (5.76)	16.64 (5.20)	19.23 (5.56)	8033
1971	15.85 (5.21)	16.39 (5.07)	16.19 (4.78)	19.52 (5.14)	20.50 (5.70)	21.34 (5.86)	16.95 (5.54)	19.06 (5.62)	6774
1972	16.61 (5.85)	16.78 (4.99)	16.30 (4.88)	19.61 (5.34)	21.30 (5.58)	21.48 (5.51)	17.18 (5.20)	19.31 (5.66)	7375
1973	17.97 (5.51)	16.44 (4.94)	15.69 (4.91)	19.15 (5.36)	21.06 (5.56)	20.59 (5.82)	16.63 (5.14)	18.86 (5.70)	7403
1974	16.67 (6.00)	15.57 (5.06)	15.63 (4.93)	18.64 (5.54)	20.41 (5.69)	20.81 (5.88)	16.06 (5.30)	18.55 (5.83)	7144
1975	16.84 (5.78)	14.89 (4.70)	15.06 (4.89)	18.20 (5.44)	20.56 (5.73)	20.63 (5.76)	15.69 (5.27)	18.30 (5.81)	6918
Total	16.57 (5.73)	16.12 (4.95)	15.87 (4.87)	19.16 (5.36)	20.85 (5.61)	20.98 (5.76)	16.56 (5.27)	18.90 (5.71)	43647

students planning on obtaining a Bachelor's degree. While declining English scores are occurring at all levels of educational aspirations, these data do not support the notion that the influx of students entering two-year colleges is a major cause of the decline.

At the same time, neither do the data disprove the notion. It cannot be stressed too strongly that not all college-bound students write college entrance exams, and many of the students planning on entering junior colleges may not have taken the tests. There is no assurance that students planning on two-year degrees are of equal representativeness from year to year, as the previous discussion of self-selection should attest.

Declines are present at all levels of aspirations for Math scores, but are far steeper in the categories representing aspiration levels of a Bachelor's degree or less. Students planning on going beyond a Bachelor's degree score lower now than before but their decline is not as marked as that of students with other educational plans. A similar pattern holds for Social Studies and Composite scores.

In sum, then, there may be some evidence that students with lower educational aspirations are contributing more to declining test scores than are students with higher educational plans. Even this apparently reasonable explanation is problematic, though, since the proportion of low aspiration testees seems to have declined somewhat over time.

Trends in Test Scores by High School Grade Average

Table 35 shows that declines have occurred at all levels of high school grade average. A brief glance at the table might suggest that the declines have been comparable throughout the distribution, but it

Table 35a. Means and Standard Deviations of ACT English Scores by Grade Point Average of ACT Testees, 1970 to 1975

Year	Grade Point Average									
	0.0-0.5	0.51-1.00	1.01-1.05	1.51-2.00	2.01-2.50	2.51-3.00	3.01-3.50	3.51-4.00	Total	N
1970	13.86 (6.48)	12.72 (5.33)	14.29 (5.17)	15.03 (5.20)	16.88 (5.12)	18.83 (4.75)	21.07 (4.44)	22.71 (4.12)	18.06 (5.55)	8033
1971	14.50 (5.81)	11.85 (4.61)	13.74 (5.16)	14.54 (5.28)	16.24 (5.10)	18.45 (4.70)	20.56 (4.47)	22.34 (4.04)	17.76 (5.53)	6774
1972	15.14 (5.46)	13.73 (5.54)	13.97 (4.52)	14.71 (4.83)	16.80 (4.82)	18.43 (4.64)	20.20 (4.37)	22.57 (4.13)	18.18 (5.25)	7375
1973	15.85 (5.63)	13.36 (4.35)	13.32 (4.76)	14.27 (4.57)	15.99 (4.64)	17.87 (4.55)	19.86 (4.31)	21.94 (4.52)	17.85 (5.18)	7403
1974	16.23 (5.41)	13.51 (5.39)	13.13 (5.10)	14.18 (4.92)	15.63 (4.77)	17.61 (4.71)	19.50 (4.47)	21.55 (4.46)	17.72 (5.29)	7144
1975	15.59 (5.23)	12.79 (5.01)	12.50 (4.50)	14.01 (4.90)	15.14 (4.78)	16.92 (4.83)	19.10 (4.62)	21.43 (4.37)	17.45 (5.34)	6918
Total	15.31 (5.67)	12.92 (5.09)	13.64 (4.96)	14.54 (5.00)	16.19 (4.92)	18.03 (4.74)	19.99 (4.50)	22.01 (4.31)	17.85 (5.36)	43647

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Table 35b. Means and Standard Deviations of ACT Math Scores by Grade Point Average of ACT Testees, 1970 to 1975.

Year	Grade Point Average									
	0.0-0.5	0.51-1.00	1.01-1.50	1.51-2.00	2.01-2.50	2.51-3.00	3.01-3.50	3.51 4.00	Total	N
1970	13.93 (6.48)	14.21 (5.68)	14.89 (5.53)	15.41 (5.87)	17.18 (6.45)	19.70 (6.45)	23.11 (6.45)	25.77 (6.19)	19.09 (7.15)	8033
1971	13.85 (6.21)	13.55 (5.92)	14.21 (5.58)	14.97 (5.94)	16.73 (6.34)	19.19 (6.58)	22.62 (6.45)	25.38 (6.11)	18.84 (7.21)	6774
1972	14.88 (6.41)	14.34 (6.33)	14.09 (5.24)	15.13 (6.01)	17.12 (6.15)	19.17 (6.51)	21.98 (6.42)	25.58 (6.02)	19.24 (7.10)	7375
1973	14.32 (6.68)	12.27 (5.93)	12.78 (5.24)	13.45 (6.03)	15.71 (6.34)	17.90 (6.66)	21.08 (6.60)	24.83 (6.34)	18.31 (7.40)	7403
1974	14.48 (7.18)	10.84 (6.34)	11.15 (6.34)	12.59 (6.61)	14.54 (6.87)	16.94 (7.21)	20.39 (6.99)	23.67 (6.83)	17.57 (7.87)	7144
1975	14.44 (7.17)	10.35 (4.61)	12.01 (6.07)	12.59 (6.09)	14.42 (6.82)	16.49 (6.84)	19.66 (7.03)	23.13 (6.56)	17.44 (7.59)	6918
Total	14.35 (6.75)	12.95 (5.99)	13.53 (5.78)	14.30 (6.16)	16.09 (6.57)	18.24 (6.82)	21.37 (6.79)	24.57 (6.46)	18.43 (7.42)	43647

Table 35c. Means and Standard Deviations of ACT Social Studies Scores by Grade Point Average of ACT Testees, 1970 to 1975

Year	Grade Point Average									
	0.0-0.5	0.51-1.00	1.01-1.50	1.51-2.00	2.01-2.50	2.51-3.00	3.01-3.50	3.51-4.00	Total	N
1970	14.58 (7.83)	13.08 (6.32)	14.50 (6.67)	15.36 (6.70)	17.18 (6.68)	19.64 (6.41)	22.29 (5.94)	24.20 (5.30)	18.76 (7.08)	8033
1971	15.00 (6.95)	13.47 (6.69)	14.05 (6.31)	14.76 (6.70)	16.95 (6.72)	19.29 (6.65)	21.86 (6.14)	23.91 (5.73)	18.61 (7.18)	6774
1972	14.85 (7.52)	14.18 (7.62)	12.87 (6.27)	14.44 (6.72)	16.61 (7.06)	18.49 (7.07)	21.01 (6.71)	24.17 (5.73)	18.45 (7.47)	7375
1973	14.41 (8.48)	11.33 (6.59)	12.63 (6.80)	13.49 (6.84)	15.79 (6.99)	17.94 (7.10)	20.61 (6.93)	23.51 (6.19)	18.05 (7.63)	7403
1974	15.23 (7.15)	11.16 (5.98)	12.32 (7.17)	12.72 (6.58)	14.71 (6.83)	16.85 (7.13)	19.75 (6.94)	22.66 (6.43)	17.35 (7.58)	7144
1975	14.66 (6.99)	11.68 (5.04)	11.50 (6.15)	12.64 (6.14)	14.15 (6.58)	16.25 (6.66)	19.00 (6.76)	22.04 (6.36)	17.00 (7.27)	6918
Total	14.81 (7.45)	12.63 (6.49)	13.28 (6.63)	14.16 (6.72)	16.03 (6.90)	18.09 (6.95)	20.65 (6.71)	23.29 (6.09)	18.05 (7.40)	43647

Table 35d. Means and Standard Deviations of ACT Natural Science Scores by Grade Point Average of ACT Testees, 1970 to 1975

Year	Grade Point Average									
	0.0-0.51	0.51-1.00	1.01-1.50	1.51-2.00	2.01-2.50	2.51-3.00	3.01-3.50	3.51-4.00	Other	N
1970	16.35 (6.73)	15.75 (5.24)	17.05 (5.94)	17.68 (5.49)	18.93 (5.86)	21.06 (5.78)	23.81 (5.52)	25.69 (5.36)	20.52 (6.31)	8033
1971	16.45 (6.75)	15.65 (5.41)	17.11 (5.29)	17.74 (5.87)	18.84 (5.74)	20.88 (6.04)	23.30 (5.95)	25.39 (5.92)	20.52 (6.46)	6774
1972	18.02 (6.53)	17.73 (6.57)	16.87 (5.09)	17.57 (5.54)	19.22 (5.75)	20.81 (5.93)	23.06 (6.00)	25.89 (5.42)	20.89 (6.36)	7375
1973	17.39 (6.37)	15.22 (4.71)	16.69 (5.69)	17.30 (5.32)	18.88 (5.60)	20.52 (5.85)	22.90 (5.83)	25.45 (5.87)	20.79 (6.33)	7403
1974	19.05 (5.98)	15.42 (5.98)	17.35 (6.00)	17.36 (5.34)	18.98 (5.61)	20.47 (5.80)	22.92 (5.86)	25.54 (5.63)	21.03 (6.29)	7144
1975	18.89 (6.30)	14.44 (4.07)	16.14 (6.12)	17.16 (5.56)	18.27 (5.98)	19.99 (5.92)	22.62 (6.00)	25.53 (5.66)	20.84 (6.53)	6918
Total	17.88 (6.48)	15.75 (5.44)	16.92 (5.68)	17.52 (5.54)	18.88 (5.76)	20.63 (5.89)	23.07 (5.88)	25.58 (5.65)	20.76 (6.38)	43647

Table 35e. Means and Standard Deviations of ACT Composite Scores by Grade Point Average of ACT Testees, 1970 to 1975

Year	Grade Point Average									
	0.0-0.5	0.51-1.00	1.01-1.50	1.51-2.00	2.01-2.50	2.51-3.00	3.01-3.50	3.51-4.00	Other	N
1970	14.75 (5.83)	14.05 (4.53)	15.30 (4.71)	15.98 (4.61)	17.66 (4.92)	19.93 (4.72)	22.69 (4.55)	24.73 (4.39)	19.23 (5.56)	8033
1971	15.06 (5.29)	13.76 (4.44)	14.90 (4.39)	15.61 (4.78)	17.30 (4.83)	19.58 (4.85)	22.21 (4.75)	24.38 (4.53)	19.06 (5.62)	6774
19	15.85 (5.47)	15.09 (5.46)	14.60 (4.16)	15.60 (4.72)	17.56 (4.88)	19.35 (5.01)	21.70 (4.97)	24.66 (4.48)	19.31 (5.66)	7375
1973	15.61 (5.95)	13.11 (4.11)	13.94 (4.47)	14.73 (4.56)	16.71 (4.66)	18.67 (4.97)	21.24 (4.88)	24.06 (4.83)	18.86 (5.70)	7403
1974	16.37 (5.51)	12.93 (4.91)	13.60 (4.98)	14.33 (4.78)	16.09 (4.90)	18.11 (5.12)	20.76 (5.00)	23.47 (4.95)	18.55 (5.83)	7144
1975	16.01 (5.48)	12.50 (3.75)	13.13 (4.72)	14.22 (4.63)	15.61 (5.01)	17.53 (5.01)	20.23 (5.11)	23.16 (4.88)	18.30 (5.81)	6918
Total	15.70 (5.60)	13.69 (4.61)	14.46 (4.62)	15.25 (4.72)	16.91 (4.92)	18.87 (5.02)	21.40 (4.96)	23.98 (4.75)	18.90 (5.71)	43647

is misleading to merely consider the absolute number of points that the scores have dropped. A more reasonable approach is to assess the decline in terms of the proportion of the baseline (1970) standard deviation that the decline represents. This technique reveals that the steepest declines consistently occur in the highest levels of high school average. Students with high GPA's in 1975 differ more in their test score performance from students with similar GPA's in 1970 than do analogous groups with lower GPA's. If nothing else, this indicates a general grade inflation in high schools.

Distribution of Test Scores by Sex

One may also look at the percentage distributions of test scores. Table 36 shows that the increased proportion of low English scores is more prominant for women than for men. In 1970, there was a disproportionately high number of low scoring men at every level of English score from 0 to 18; at every higher level there was a disproportionate number of women. This pattern holds rather consistently throughout the six years, although it seems to be becoming less pronounced in the more recent administrations of the tests. Women still score higher in English than do men, but increasingly there are relatively more women in the lower end of the distribution, even considering the increased proportion of women taking the tests.

A somewhat different pattern holds for Math scores, where, unlike English scores, there is a disproportionate number of low scoring women. Also, unlike the English distribution, this differential "levels out" more quickly. With English scores, the sex ratio at a given test score does not begin to approximate the overall sex ratio of the test-taking

Table 36a. Percentage Distribution of ACT English Scores by Sex, 1970 to 1975

	Sex													
	Men							Women						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	3.8	4.2	1.7	1.9	2.5	3.3	2.9	2.0	2.4	1.1	1.1	1.6	1.9	1.7
7-12	19.4	18.5	18.8	18.8	19.2	20.1	19.1	12.1	11.8	13.5	13.1	14.5	14.9	13.3
13-18	30.3	33.8	32.6	36.6	36.9	36.0	34.2	23.1	27.4	29.1	32.0	31.3	34.3	29.5
19-24	40.7	37.2	39.9	36.9	35.2	34.9	37.6	49.9	46.8	44.1	43.5	43.2	40.5	44.7
25-30	5.6	5.9	6.6	5.5	5.9	5.5	5.8	12.5	11.4	11.5	9.6	8.8	7.8	10.3
31-36	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.2	0.8	0.7	0.5	0.6	0.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(4007)	(3389)	(3616)	(3522)	(3321)	(3133)	(20988)	(4026)	(3385)	(3759)	(3881)	(3823)	(3785)	(22659)

Table 36b. Percentage Distribution of ACT Math Scores by Sex, 1970 to 1975

	Sex													
	Men							Women						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	2.6	3.8	3.1	4.2	7.2	6.1	4.4	4.8	5.9	5.2	6.9	11.3	9.7	7.3
7-12	10.8	10.8	10.9	13.4	14.8	13.9	12.3	15.1	16.0	15.9	20.8	20.0	22.7	18.4
13-18	30.9	31.2	29.1	28.8	26.6	25.4	28.8	35.3	36.6	37.0	34.7	31.6	32.0	34.5
19-24	23.0	22.3	21.3	22.0	19.4	21.4	21.8	23.2	22.3	20.1	19.8	18.2	19.0	20.4
25-30	26.0	25.6	29.4	26.5	27.6	25.9	27.1	18.7	16.7	19.7	15.4	17.5	15.1	17.2
31-36	6.8	6.3	6.2	5.2	4.3	4.6	5.6	3.0	2.5	2.0	2.4	1.5	1.4	2.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(4007)	(3389)	(3616)	(3522)	(3321)	(3133)	(20988)	(4026)	(3385)	(3759)	(3881)	(3823)	(3785)	(22659)

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Table 36c. Percentage Distribution of ACT Social Studies Scores by Sex, 1970 to 1975

	Sex													
	Men							Women						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	4.9	4.7	4.8	6.0	6.0	5.1	5.2	5.4	5.9	6.5	8.2	9.2	6.8	7.0
7-12	17.7	18.5	19.4	18.6	20.5	24.6	19.8	19.2	20.9	25.1	24.8	28.3	32.0	25.1
13-18	20.4	18.6	17.1	16.2	18.4	20.3	18.5	20.7	19.0	18.6	18.3	20.0	22.2	19.8
19-24	30.0	30.5	29.0	30.8	27.7	26.4	29.3	32.0	31.6	28.2	29.1	26.6	23.4	28.5
25-30	24.1	25.1	26.5	25.2	23.6	21.5	24.4	21.0	21.3	20.3	18.1	14.6	14.5	18.3
31-36	2.4	2.6	3.1	3.1	3.8	2.1	2.9	1.5	1.3	1.4	1.4	1.2	1.2	1.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(4007)	(3389)	(3616)	(3522)	(3321)	(3133)	(20988)	(4026)	(3385)	(3759)	(3881)	(3823)	(3785)	(22659)

Table 36d. Percentage Distribution of ACT Natural Science Scores by Sex, 1970 to 1975

	Sex													
	Men							Women						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	1.1	1.4	0.9	0.5	0.5	0.8	0.9	1.4	1.8	1.0	0.9	0.5	1.2	1.1
7-12	6.4	6.1	5.6	4.9	4.6	5.7	5.6	8.5	10.0	8.8	9.7	7.5	10.6	9.2
13-18	29.0	26.1	28.2	27.6	26.9	25.4	27.3	34.6	34.4	37.5	38.4	38.3	32.2	35.9
19-24	28.1	30.0	26.0	28.4	28.3	28.8	28.2	30.4	29.6	27.8	29.3	29.6	29.4	29.4
25-30	28.8	27.9	30.1	27.3	28.3	28.6	28.5	27.6	21.6	21.4	18.0	19.7	22.6	21.0
31-36	6.5	8.4	9.2	11.2	11.4	10.4	9.4	2.6	2.7	3.4	3.7	4.3	4.0	3.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(4007)	(3389)	(3616)	(3522)	(3321)	(3133)	(20988)	(4026)	(3385)	(3759)	(3881)	(3823)	(3785)	(22659)

Table 36e. Percentage Distribution of ACT Composite Scores by Sex, 1970 to 1975

	Sex													
	Men							Women						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	0.7	0.8	0.4	0.5	1.1	0.8	0.7	0.7	0.9	0.4	0.8	0.6	0.8	0.7
7-12	11.7	12.6	11.0	12.3	13.3	16.1	12.7	12.6	13.6	14.8	16.0	19.1	19.7	16.0
13-18	30.9	29.7	28.2	29.7	29.3	27.1	29.2	33.1	34.2	34.2	36.3	35.1	36.4	34.9
19-24	34.4	35.0	36.2	34.3	34.1	34.9	34.8	36.0	35.1	33.8	32.8	31.4	29.7	33.1
25-30	21.3	20.8	22.6	21.7	20.9	20.2	21.3	16.9	15.9	16.1	13.3	13.2	13.1	14.7
31-36	1.0	1.2	1.5	1.4	1.3	0.9	1.2	0.6	0.4	0.7	0.7	0.5	0.4	0.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(4007)	(3389)	(3616)	(3522)	(3321)	(3133)	(20988)	(4026)	(3385)	(3759)	(3881)	(3823)	(3785)	(22659)

cohort until scores reach about 19 (which, depending on the year, corresponds to the 54th to 61st percentile). With Math scores, the cell ratios start to correspond more exactly at a score of about 13 (the 21st to 32nd percentile).

There is at the same time a marked preponderance in 1970 toward a disproportionate number of males in the upper end of the Math distribution. This is especially noticable for extremely high scores (i.e., those in the 31 to 36 range).

The salient change between early and later distributions of ACT-Math scores regarding sex differences occurs in the lower end of the distribution. An increasingly high proportion of women is beginning to fall into these bottom categories. Again, this suggests that more relatively lower achieving women are now writing the exams.

The ratio of low scoring women to low scoring men on the Social Studies test has steadily increased. In the earlier administrations of the test the cell percentages at any given level of test score (except the very highest levels of 25 or above) are about commensurate with the sex ratio of the testees. Since then the trend has been toward disproportionate numbers of low scoring women. There is a consistently higher proportion of very high scoring men, although this has fluctuated somewhat over time.

Men consistently outperform women at all levels of Natural Science scores. The data seem to indicate that this differential is widening in the lower and middle ranges, but that the ratio has remained relatively constant over time in the upper reaches of the distribution.

Male scores are persistently above those of women on the ACT-Composite. Consider for example the "Total" column of each panel in

the table. Whereas 13.4 percent of male scores are below 12, 16.7 percent of female scores are below this figure. A similar pattern holds at each other upper boundary of a particular interval. This is not an artifact of the higher proportion of female testees; the proportion of low scoring women exceeds the proportion of low scoring men.

In sum, there is a great deal of evidence suggesting that the changing composition of the test-taking population has been accompanied by a greatly increased proportion of low scoring women. This is quite probably the case, and if one accepts that this is a major contributor to the general score decline, is not necessarily disturbing. Perhaps it even allows the decline to be interpreted as a good thing, in that it represents more equal opportunity between the sexes. Consider the following speculation. Arbitrarily divide potential college students into four groups: bright males, less bright males, bright females, and less bright females. Traditionally the first three groups have been likely to attend college,[16] while more recently, whether because of the feminist movement or other social processes leading to increased educational opportunity, and as evidenced by the increased proportion of females taking college entrance tests, the group of less bright females is beginning to be more highly represented among college aspirants. Thus, discrimination based on sex is reduced and equality of opportunity is increased, and one result of this trend is a decline in test scores.

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[16] The research of Sewell and Shah (1967, 1968) provides ample support for this assertion.

While declines have been more precipitous for women than for men and while this probably has some utility in explaining depressed scores, it is not necessarily true that this aspect of the changed pool is exerting that much impact. It does nothing to explain the decline in male scores, and it is not certain how much of the increased proportion of women taking the tests is due to a possible drift of men away from college or to a drift of women toward college. A potentially important question (which cannot be assessed here) is "Why has the sex composition of the sample changed?" Men might be taking college admissions tests in lesser proportions as a reaction to the end of the draft or to a changing job market, while the increased proportion of female testees may be a result of the general trend toward equal opportunity for women. To adequately address the full impact of the increased proportion of female testees on test scores, more should be known about the characteristics of the women taking tests now who would not have been taking them a few years ago, and about the characteristics of the men who are not now taking the tests who would have earlier (assuming this group does in fact exist).

Distribution of Test Scores by Race

On the 1970 English test, there are disproportionately low numbers of low scoring whites at every level of scores below 12 (see Table 37). For scores between 13 and 18 the proportion white is reasonably commensurate with the overall race distribution, and at levels above that there are disproportionate numbers of whites. How well does this pattern hold up over time? The data do not allow a completely unambiguous answer to this, but one may note that the ratio of the column

Table 37a. Percentage Distribution of ACT English Scores by Racial Group, 1970 to 1975

	Race													
	White							Black						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	1.4	[illegible]	0.5	0.5	1.1	0.9	1.1	14.3	14.1	6.5	7.7	9.4	15.3	11.2
7-12	11.6	11.0	10.6	11.1	12.9	13.4	11.7	45.2	40.6	49.1	40.0	42.9	40.3	43.0
13-18	25.8	29.8	29.5	32.9	33.3	34.8	30.8	26.7	29.5	31.2	36.5	31.1	30.7	31.0
19-24	50.2	46.9	47.8	45.7	43.7	42.8	46.3	13.3	14.5	11.7	14.8	15.5	13.0	13.8
25-30	10.6	10.1	10.9	9.1	8.6	7.7	9.6	0.5	1.3	1.5	1.0	1.1	0.6	1.0
31-36	0.4	0.3	0.6	0.7	0.4	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(6058)	(5288)	(5652)	(5088)	(5204)	(5082)	(32372)	(442)	(475)	(462)	(493)	(466)	(476)	(2814)

Table 37a. (cont.)

	Race													
	Spanish American							American Indian						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	9.5	8.6	4.6	5.0	6.8	8.4	7.1	9.2	9.5	2.5	3.3	6.1	5.1	5.4
7-12	34.2	29.5	37.9	32.7	32.9	31.0	33.1	30.8	21.6	34.2	25.0	23.2	35.4	28.0
13-18	25.3	38.1	31.4	43.7	36.0	38.1	35.4	33.8	32.4	40.5	41.1	39.0	44.4	39.4
19-24	29.5	22.3	25.5	16.6	22.4	18.1	22.4	24.6	29.7	19.0	28.3	30.5	14.1	24.7
25-30	1.6	0.7	0.7	2.0	0.6	4.5	1.7	1.5	5.4	3.8	2.2	1.2	1.0	2.4
31-36	0.0	0.7	0.0	0.0	1.2	0.0	0.3	0.0	1.4	0.0	0.0	0.0	0.0	0.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(190)	(139)	(153)	(199)	(161)	(155)	(997)	(65)	(74)	(79)	(180)	(82)	(99)	(579)

Table 37a. (cont.)

	Race													
	Oriental American							Other or Missing						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	5.9	2	1.1	4.2	8.8	2.4	4.4	4.5	5.0	3.4	1.9	2.2	3.5	3.2
7-12	32.6	31.3	39.3	33.3	13.3	23.8	31.0	20.6	23.2	25.7	20.2	20.7	21.2	21.7
13-18	28.1	34.4	31.5	35.4	28.9	35.7	31.6	30.7	35.6	37.3	35.6	37.5	37.3	35.6
19-24	27.4	25.0	22.5	25.0	44.4	33.3	27.9	37.6	31.1	28.6	35.6	32.9	31.4	33.2
25-30	5.9	5.2	4.5	2.1	4.4	4.8	4.8	6.5	5.1	4.3	6.2	6.4	6.1	5.9
31-36	0.0	0.0	1.1	0.0	0.0	0.0	0.2	0.2	0.0	0.6	0.5	0.4	0.5	0.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(135)	(96)	(89)	(48)	(45)	(42)	(455)	(1143)	(702)	(940)	(1395)	(1186)	(1064)	(6430)

Table 37b. Percentage Distribution of ACT Math Scores by Racial Group, 1970 to 1975

	Race													
	White							Black						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	2.8	3.2	2.4	3.5	6.5	6.0	4.0	12.0	18.3	15.6	20.9	27.9	24.2	19.9
7-12	10.4	10.5	10.0	13.1	14.7	15.4	12.4	35.7	32.6	36.1	36.7	35.0	38.0	35.7
13-18	31.2	33.1	32.0	31.3	29.7	29.1	31.1	41.6	39.6	36.4	30.8	25.3	27.7	33.5
19-24	24.8	24.0	22.6	22.5	20.5	22.6	22.9	8.1	6.7	6.9	9.1	7.9	7.4	7.7
25-30	25.2	24.0	28.1	24.3	25.2	23.6	25.1	2.5	2.7	4.8	2.4	3.9	2.5	3.1
31-26	5.6	5.2	4.8	4.6	3.4	3.3	4.5	0.0	0.0	0.2	0.0	0.0	2.1	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(6058)	(5288)	(5652)	(5088)	(5204)	(5082)	(32372)	(442)	(475)	(462)	(493)	(466)	(476)	(2814)

Table 37b. (cont.)

	Race													
	Spanish American							American Indian						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	6.8	10.8	14.4	12.6	26.1	12.9	13.7	4.6	10.8	10.1	3.9	14.6	20.[illegible]	10.0
7-12	26.3	27.3	24.2	28.1	27.3	32.3	27.6	29.2	16.2	32.9	32.2	29.3	37.4	30.4
13-18	38.9	37.4	39.9	39.7	26.7	27.1	35.2	44.6	47.3	34.2	36.7	23.2	23.2	34.4
19-24	15.8	15.8	14.4	10.6	8.1	16.1	13.3	10.8	16.2	16.5	17.2	19.5	7.1	14.9
25-30	11.6	7.9	7.2	8.5	10.6	11.6	9.6	10.8	8.1	5.1	9.4	13.4	12.1	9.8
31-36	0.5	0.7	0.0	0.5	1.2	0.0	5.0	0.0	1.4	1.3	0.6	0.0	0.0	0.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(190)	(139)	(153)	(199)	(161)	(155)	(997)	(65)	(74)	(79)	(180)	(82)	(99)	(579)

Table 37b. (cont.)

	Race													
	Oriental American							Other or Missing						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	5.2	3.1	2.2	6.3	6.7	4.8	4.4	4.3	6.6	6.8	7.2	12.5	9.2	7.9
7-12	12.6	21.9	23.6	10.4	20.0	23.8	18.2	14.7	18.4	18.7	19.7	21.0	22.1	19.2
13-18	43.0	36.5	31.5	47.9	20.0	26.2	36.0	37.1	33.6	37.7	32.2	29.9	30.1	33.3
19-24	17.0	20.8	20.2	20.8	20.0	16.7	19.1	22.0	21.9	16.9	20.9	16.8	19.2	19.6
25-30	17.0	13.5	20.2	12.5	26.7	23.8	18.0	18.0	17.2	17.1	17.3	18.4	16.8	17.5
31-36	5.2	4.2	2.2	2.1	6.7	4.8	4.2	3.8	2.3	2.8	2.7	1.4	2.6	2.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(135)	(96)	(89)	(48)	(45)	(42)	(455)	(1143)	(7032)	(940)	(1395)	(1186)	(1064)	(6430)

Table 37c. Percentage Distribution of ACT Social Studies Scores by Racial Group, 1970 to 1975

	Race													
	White							Black						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	2.9	3.0	3.1	4.1	4.8	3.3	3.5	21.3	22.9	20.3	25.2	31.5	26.7	24.7
7-12	14.5	15.7	17.6	18.1	21.6	25.9	18.7	43.4	44.4	56.6	42.4	43.1	45.2	44.8
13-18	20.4	18.8	17.6	17.3	19.6	21.8	19.3	19.2	16.7	13.0	14.0	11.6	11.3	14.9
19-24	33.9	33.5	31.7	32.8	30.0	27.4	31.6	12.7	12.4	11.3	15.0	9.4	8.8	11.6
25-30	26.0	26.8	27.4	25.2	21.3	19.9	24.5	3.2	3.4	4.8	3.4	4.3	4.0	3.8
31-36	2.3	2.2	2.6	2.7	2.8	1.8	2.4	0.2	0.2	0.0	0.0	0.0	0.0	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(6058)	(5388)	(5652)	(5088)	(5204)	(5082)	(32372)	(442)	(475)	(462)	(493)	(466)	(476)	(2814)

Table 37c. (cont.)

	Race													
	Spanish American							American Indian						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	15.3	12.2	17.0	14.1	18.0	12.9	14.9	24.6	5.4	13.9	13.9	4.9	13.1	14.2
7-12	27.9	33.8	37.3	39.2	39.1	38.7	35.9	32.3	32.4	41.8	30.0	42.7	47.5	37.0
13-18	20.0	20.9	17.6	19.1	18.0	19.4	19.2	16.9	18.9	19.0	20.6	11.0	22.2	18.7
19-24	22.1	20.9	17.6	18.6	14.3	13.5	18.0	15.4	23.0	24.1	23.9	18.3	11.1	19.9
25-30	14.2	11.5	10.5	8.0	8.7	14.2	11.1	7.7	14.9	1.3	11.7	9.8	5.1	8.8
31-36	0.5	0.7	0.0	1.0	1.9	1.3	0.9	3.1	5.4	0.0	0.0	2.4	1.0	1.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(190)	(139)	(153)	(199)	(161)	(155)	(997)	(65)	(74)	(79)	(180)	(82)	(99)	(579)

Table 37c. (cont.)

	Race													
	Oriental American.							Other or Missing						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	11.9	15.6	13.5	6.3	11.1	4.8	11.6	7.4	7.7	10.2	10.0	9.3	8.2	8.9
7-12	32.6	32.3	37.1	41.7	20.0	28.6	32.7	25.6	27.6	31.7	24.1	28.1	31.4	27.8
13-18	14.8	15.6	16.9	22.9	26.7	35.7	19.3	22.9	20.2	21.9	17.8	21.1	21.2	20.8
19-24	28.9	24.0	21.3	18.8	20.0	11.9	22.9	27.4	28.6	21.6	28.5	24.1	22.7	25.5
25-30	11.9	11.5	10.1	10.4	15.6	14.3	11.9	15.4	14.2	13.0	17.8	15.8	15.0	15.5
31-36	0.0	1.0	1.0	0.0	6.7	4.8	1.5	1.2	1.6	1.6	1.8	1.7	1.4	1.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(135)	(96)	(89)	(48)	(45)	(42)	(455)	(1143)	(702)	(940)	(1395)	(1186)	(1064)	(6430)

Table 37d. Percentage Distribution of ACT Natural Science Scores by Racial Group, 1970 to 1975

	Race													
	White							Black						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	0.6	0.7	0.4	0.3	0.1	0.4	0.4	5.7	6.9	5.0	3.4	3.6	5.0	4.9
7-12	4.9	5.1	4.5	4.7	3.7	6.0	4.8	24.9	30.7	26.6	25.2	27.3	28.2	27.1
13-18	28.7	27.3	28.4	29.3	29.3	26.4	28.2	54.3	45.5	53.5	52.9	51.3	43.2	50.4
19-24	31.1	31.8	29.3	30.9	30.8	30.9	30.8	12.0	13.1	12.3	13.2	14.8	15.3	13.5
25-30	29.4	28.5	30.0	25.9	27.1	28.6	28.3	3.2	3.8	1.9	5.3	2.6	5.7	3.8
31-36	5.3	6.5	7.4	8.8	8.9	7.8	7.4	0.0	0.0	0.6	0.0	0.4	0.6	0.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(6058)	(5388)	(5652)	(5088)	(5204)	(5082)	(32372)	(442)	(475)	(462)	(493)	(466)	(476)	(2814)

Table 37d. (cont.)

	Race													
	Spanish American							American Indian						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	4.2	3.6	2.0	1.5	2.5	3.2	2.8	3.1	5.4	5.1	0.6	1.2	1.0	2.2
7-12	18.9	23.0	17.6	16.1	19.3	14.8	18.2	26.2	12.6	11.4	11.1	11.0	17.2	14.0
13-18	41.6	44.6	53.6	53.3	41.6	38.7	45.7	36.9	41.9	55.7	52.2	48.8	45.5	48.0
19-24	23.2	18.0	18.0	21.1	24.8	26.5	21.9	23.1	20.3	21.5	22.2	20.7	26.3	22.5
25-30	11.6	9.4	9.2	6.5	7.5	12.3	9.3	9.2	13.5	5.1	12.8	14.6	7.1	10.7
31-36	0.5	1.4	0.7	1.5	4.3	4.5	2.1	1.5	6.8	1.3	1.1	3.7	3.0	2.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(190)	(139)	(153)	(199)	(161)	(155)	(997)	(65)	(74)	(79)	(180)	(82)	(99)	(579)

Table 37d. (cont.)

	Race													
	Oriental American							Other or Missing						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	3.7	0.0	2.2	0.0	0.0	9.5	2.4	1.9	3.6	1.7	1.1	0.7	1.6	1.6
7-12	17.0	17.7	7.9	6.3	8.9	7.1	12.5	10.1	10.0	11.7	9.4	6.2	10.1	9.4
13-18	34.8	43.8	48.3	39.6	28.9	28.6	38.7	37.5	36.9	43.3	35.1	39.9	32.2	37.3
19-24	23.7	26.0	19.1	35.4	35.6	31.0	26.4	28.3	29.9	22.8	28.6	27.8	27.5	27.5
25-30	15.6	10.4	20.2	14.6	11.1	19.0	15.2	19.2	16.7	16.6	19.7	20.2	22.3	19.4
31-36	5.2	2.1	2.2	4.2	15.6	4.8	4.8	2.9	3.0	3.9	6.0	5.1	6.2	4.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(135)	(96)	(89)	(48)	(45)	(42)	(455)	(1143)	(702)	(940)	(1395)	(1186)	(1064)	(6430)

Table 37e. Percentage Distribution of ACT Composite Scores by Racial Group, 1970 to 1975

	Race													
	White							Black						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	0.3	0.2	0.1	0.1	0.2	0.2	0.2	3.6	6.5	3.2	3.2	6.4	5.0	4.7
7-12	6.9	7.7	7.1	8.5	10.9	12.2	8.8	52.3	52.4	50.6	51.3	55.8	57.1	53.3
13-18	30.5	30.9	29.1	31.5	31.8	32.8	31.1	35.3	29.9	35.3	33.9	26.4	25.8	31.1
19-24	39.1	38.7	39.6	37.9	36.6	35.2	37.9	7.9	10.1	9.1	10.3	9.7	10.7	9.7
25-30	22.2	21.6	23.0	20.8	19.5	19.0	21.1	1.0	1.1	1.7	1.2	1.7	1.3	1.3
31-36	0.9	0.9	1.2	1.2	1.0	0.7	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(6058)	(5288)	(5652)	(5088)	(5204)	(5082)	(32372)	(442)	(475)	(462)	(493)	(466)	(476)	(2814)

Table 37e. (cont.)

	Race													
	Spanish-American							American Indian						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	2.6	0.7	0.7	0.5	4.3	2.	2.0	4.6	5.4	1.3	0.6	0	.0	2.2
7-12	34.2	39.3	39.2	35.7	44.7	38.1	37.7	38.5	18.9	34.2		.1	42.4	31.8
13-18	34.2	38.1	36.6	42.2	31.7	27.1	35.2	40.0	43.2	40.5	43.3	30.5	37.4	39.7
19-24	22.1	19.4	19.6	16.6	13.0	24.5	19.2	9.2	21.6	22.8	25.0	28.0	13.1	20.9
25-30	6.8	6.5	3.9	4.5	5.6	7.1	5.7	6.2	9.5	0.0	4.4	6.1	3.0	4.7
31-36	0.0	0.0	0.0	0.5	0.6	0.0	0.2	1.5	1.4	1.3	0.0	1.2	0.0	0.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(190)	(139)	(153)	(199)	(161)	(155)	(997)	(65)	(74)	(79)	(180)	(82)	(99)	(579)

Table 37e. (cont.)

	Race													
	Oriental American							Other or Missing						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	3.0	1.0	0.0	2.1	0.0	0.0	1.3	0.9	1.3	1.0	1.6	0.8	1.0	1.1
7-12	24.4	32.3	25.8	16.7	13.3	21.4	24.2	17.7	19.4	22.2	17.3	20.3	23.2	19.9
13-18	39.8	32.3	39.3	47.9	37.8	40.5	37.4	37.4	38.7	40.2	36.0	37.4	32.4	36.8
19-24	26.7	24.0	23.6	25.0	24.4	23.8	24.8	30.1	30.2	24.8	29.7	27.7	29.9	28.8
25-30	11.1	10.4	10.1	8.3	20.0	14.3	11.6	13.5	10.1	10.7	14.3	13.0	12.7	12.7
31-36	0.0	0.0	1.1	0.0	4.4	0.0	0.7	0.5	0.3	1.7	1.1	0.8	0.8	0.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(135)	(96)	(89)	(48)	(45)	(42)	(455)	(1143)	(702)	(940)	(1395)	(1186)	(1064)	(6430)

percentage in a particular cell to the percentage of the sample that is white in the corresponding year is relatively invariant across each row. This seems to indicate that while the mean score for whites is declining, they nonetheless continue to be overrepresented in high scoring categories and underrepresented in low scoring categories in comparison to other racial groups.

The largest minority group of testees is the black population. On the 1970 English test, blacks were highly overrepresented in the lower levels of the distribution and badly underrepresented at the top. This pattern has continued in a relatively unattenuated manner since. Thus, the performance of blacks does not seem to have substantially altered over time, which again indicates that race is not the explanation for the score decline.

As one might expect, the data for Math, Social Studies, Natural Science, and Composite scores show similar results. In general, the results are: 1) Whites are disproportionately low in the lower end of the distribution and disproportionately high in the upper end; 2) The pattern is the opposite for minorities; and 3) This pattern seems stable over time.

Distribution of Test Scores by Educational Plans

In 1970, students aspiring for degrees less than a Bachelor's contributed disproportionately fewer high scores and disproportionately more low scores on every ACT exam (see Table 38). The opposite pattern was in evidence for students with aspirations for a Bachelor's or higher degree. Not too surprisingly, this pattern has persisted, but it is not nearly as marked as it once was. For example, while the proportion of the sample planning on a Bachelor's degree has varied little over time, a consistently higher percentage of lower

Table 38a. Percentage Distribution of ACT English Scores by Degree Aspirations of ACT Testees, 1970 to 1975

	Degree Aspirations													
	Vocational/Technical							2-year						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	4.1	4.0	1.6	1.6	2.7	4.5	3.1	5.2	6.0	2.4	2.8	2.9	3.5	3.8
7-12	23.4	24.6	25.2	20.6	25.4	25.6	24.0	23.8	21.3	22.9	24.7	25.7	28.7	24.3
13-18	36.0	36.1	35.8	40.8	41.0	42.1	38.4	32.8	35.5	38.9	41.4	38.8	38.8	37.6
19-24	33.6	31.5	32.9	34.1	28.5	26.3	31.4	35.6	34.2	32.6	28.4	30.1	26.7	31.5
25-30	2.9	3.7	4.5	2.9	2.3	1.5	3.0	2.6	3.0	3.1	2.8	2.5	2.1	2.7
31-36	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(342)	(321)	(310)	(311)	(256)	(266)	(1806)	(1244)	(1082)	(1207)	(1216)	(973)	(894)	(6616)

Table 38a. (cont.)

	Degree Aspirations													
	Bachelor's							Masters'						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	2.1	2.2	1.2	1.4	1.7	2.2	1.8	1.6	2.6	0.7	0.7	1.2	1.2	1.4
7-12	12.7	12.7	13.8	14.3	15.8	16.3	14.2	11.7	12.1	11.8	10.7	11.2	11.0	11.4
13-18	25.9	31.4	30.5	33.2	33.7	36.7	31.7	23.1	25.7	23.1	27.2	28.9	30.8	26.2
19-24	48.6	45.2	44.8	42.2	40.8	38.5	43.6	49.4	46.6	48.7	47.2	46.6	45.1	47.4
25-30	10.6	8.3	9.2	7.3	7.6	5.8	8.2	13.1	12.4	14.7	13.3	11.5	11.1	12.8
31-36	0.1	0.2	0.5	0.6	0.4	0.5	0.4	1.0	0.6	1.0	1.0	0.6	0.8	0.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(3322)	(2647)	(2911)	(2852)	(2940)	(2846)	(17518)	(1456)	(1251)	(1258)	(1162)	(1069)	(1065)	(7261)

Table 38a. (cont.)

	Degree Aspirations													
	Professional							Missing or Other						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	3.0	2.1	0.9	1.0	1.2	1.7	1.6	4.7	6.8	2.6	1.7	5.0	5.7	4.4
7-12	12.3	11.5	11.9	12.4	11.9	12.1	12.0	26.6	22.8	26.1	20.4	21.9	23.2	23.6
13-18	22.0	25.5	27.1	31.9	31.8	29.6	28.4	29.0	34.3	36.8	40.0	36.9	38.5	35.7
19-24	49.6	45.2	45.9	43.3	43.3	45.1	45.2	37.4	31.3	30.4	34.3	32.7	29.0	32.6
25-30	12.7	15.1	13.2	10.5	11.0	11.2	12.1	2.4	4.6	3.6	3.9	3.5	3.3	3.5
31-36	0.5	0.5	1.0	0.9	0.9	0.2	0.7	0.0	0.1	0.5	0.0	0.0	0.3	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(1003)	(946)	(1107)	(1343)	(1240)	(1265)	(6904)	(666)	(527)	(582)	(519)	(666)	(582)	(3542)

Table 38b. Percentage Distribution of ACT Math Scores by Degree Aspirations of ACT Testees, 1970 to 1975

	Degree Aspirations													
	Vocational/Technical							2-year						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	3.8	8.4	5.5	8.7	18.8	15.4	9.6	7.6	8.4	8.4	10.5	16.3	14.2	10.6
7-12	22.8	22.4	23.5	26.0	28.1	27.1	24.8	20.8	23.4	21.8	27.2	26.5	31.3	24.8
13-18	44.4	45.8	44.2	33.4	30.5	37.6	39.7	45.4	43.7	44.6	38.3	34.7	33.1	40.4
19-24	19.0	12.8	12.3	19.3	12.1	13.9	15.1	17.8	17.3	15.3	14.2	13.7	15.8	15.7
25-30	9.9	10.3	13.9	12.2	10.5	6.0	10.6	8.0	6.7	9.4	9.2	8.2	5.3	7.9
31-36	0.0	0.3	0.6	0.3	0.0	0.0	0.2	0.3	0.6	0.6	0.5	0.5	0.3	0.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(342)	(321)	(310)	(311)	(256)	(266)	(1806)	(1244)	(1082)	(1207)	(1216)	(973)	(894)	(6616)

Table 38b. (cont.)

	Degree Aspirations													
	Bachelor's							Master's						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	3.0	3.4	3.2	4.7	7.9	7.9	5.0	1.8	4.0	2.9	3.2	7.3	4.6	3.8
7-12	11.0	11.0	11.7	15.8	16.3	18.2	14.0	8.4	8.9	8.6	11.9	12.3	13.8	10.4
13-18	31.4	34.6	32.5	33.2	31.3	31.2	32.3	26.2	27.3	24.7	24.5	24.7	22.0	25.0
19-24	25.5	24.5	23.1	22.8	19.6	21.0	22.8	24.1	24.2	23.1	23.3	20.9	24.4	23.4
25-30	24.5	22.6	26.1	20.4	23.1	19.7	22.8	30.2	28.1	33.3	29.9	29.9	30.1	30.3
31-36	4.5	3.8	3.4	3.0	1.9	1.9	3.1	9.3	7.4	7.5	7.1	4.9	5.1	7.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(3322)	(2647)	(2911)	(2852)	(2940)	(2846)	(17518)	(1458)	(1251)	(1258)	(1162)	(1069)	(1065)	(7261)

Table 38b. (cont.)

	Degree Aspirations													
	Professional							Other or Missing						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	2.2	3.1	2.0	3.6	4.8	4.1	3.4	6.2	8.2	7.2	7.9	14.3	11.3	9.3
7-12	8.4	8.4	7.9	11.4	12.2	10.5	10.0	20.0	19.2	23.1	24.1	24.8	24.7	22.7
13-18	25.3	24.6	26.7	27.7	24.2	24.3	25.5	39.2	35.1	41.0	36.0	28.8	30.9	35.1
19-24	23.1	22.6	21.6	21.7	20.9	23.0	22.1	20.4	22.0	19.2	18.5	17.7	17.4	19.2
25-30	32.0	32.3	33.6	28.7	31.2	31.6	31.4	12.6	13.3	18.6	12.5	13.8	14.8	14.3
31-36	9.0	9.0	8.2	7.0	6.7	6.4	7.6	1.7	2.3	1.3	1.0	0.6	0.9	1.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(1003)	(946)	(1107)	(1343)	(1240)	(1265)	(6904)	(666)	(527)	(582)	(519)	(666)	(582)	(3542)

Table 38c. Percentage Distribution of ACT Social Studies Scores by Degree Aspirations of ACT Testees, 1970 to 1975

	Degree Aspirations													
	Vocational/Technical							2-year						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	9.4	8.7	7.7	11.9	14.5	9.8	10.2	10.2	9.5	11.1	13.6	13.5	12.8	11.7
7-12	30.1	29.9	35.2	29.9	34.4	45.1	33.7	28.1	29.9	33.5	34.2	34.4	40.8	33.1
13-18	25.7	20.6	20.6	20.6	23.4	24.1	22.5	24.8	22.6	21.5	21.5	23.1	22.7	22.7
19-24	22.5	30.2	25.5	28.0	19.1	15.0	23.7	28.9	28.7	23.7	21.5	19.9	18.2	23.8
25-30	11.7	10.0	10.6	9.3	8.2	6.0	9.5	8.0	8.9	10.0	8.7	9.0	5.1	8.4
31-36	0.6	0.6	0.3	0.3	0.4	0.0	0.4	0.0	0.3	0.2	0.4	0.0	0.3	0.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(342)	(321)	(310)	(311)	(256)	(266)	(1806)	(1244)	(1082)	(1207)	(1216)	(973)	(894)	(6616)

Table 38c. (cont.)

	Degree Aspirations													
	Bachelor's							Master's						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	3.3	3.7	4.3	5.6	6.9	4.8	4.7	3.4	3.8	3.2	3.8	4.0	2.7	3.5
7-12	16.0	17.6	20.7	20.2	24.3	29.7	21.3	11.7	15.2	15.1	13.3	18.2	18.5	15.1
13-18	21.0	19.2	18.8	16.9	19.8	23.0	19.8	16.4	15.4	14.0	14.7	14.9	18.9	15.7
19-24	34.7	34.3	30.9	33.2	29.6	25.2	31.4	32.1	30.1	30.4	31.8	31.6	28.6	30.8
25-30	23.1	24.3	23.6	22.3	17.6	16.3	21.2	33.2	32.9	32.8	32.9	28.1	27.8	31.5
31-36	1.8	1.0	1.7	1.9	1.8	1.0	1.6	3.3	2.6	4.5	3.5	3.2	3.5	3.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(3322)	(2647)	(2911)	(2852)	(2940)	(2846)	(17518)	(1456)	(1251)	(1258)	(1162)	(1069)	(1065)	(7261)

Table 38c. (cont.)

	Degree Aspirations													
	Professional							Missing or Other						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	4.4	2.6	3.3	5.4	3.5	3.7	3.9	7.8	11.4	9.6	10.2	14.0	10.7	10.6
7-12	11.8	11.4	14.3	16.6	18.5	18.9	15.6	31.5	28.5	31.4	29.7	30.5	37.3	31.5
13-18	14.7	17.0	13.4	14.3	16.4	17.9	15.6	25.8	19.4	21.0	21.8	22.1	21.6	22.1
19-24	29.5	28.3	29.5	30.7	27.6	29.5	29.2	24.1	26.9	23.7	27.2	21.5	19.6	23.7
25-30	35.2	33.9	35.1	28.6	28.0	26.6	30.9	9.9	13.1	13.2	10.4	10.5	10.8	11.3
31-36	4.5	6.7	4.3	4.5	6.0	3.3	4.8	0.8	0.8	1.0	0.8	1.5	0.0	0.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(1003)	(946)	(1107)	(1343)	(1240)	(1265)	(6904)	(666)	(527)	(582)	(519)	(666)	(582)	(3542)

Table 38d. Percentage Distribution of ACT Natural Science Scores by Degree Aspirations of ACT Testees, 1970 to 1975

	Degree Aspirations													
	Vocational/Technical							2-year						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	2.0	1.2	1.6	1.0	1.2	1.5	1.4	1.9	2.7	2.0	0.7	1.0	2.1	1.7
7-12	12.0	12.8	9.0	12.5	11.3	16.5	12.3	14.2	12.4	12.8	13.6	8.8	15.8	13.0
13-18	47.1	40.8	43.5	43.7	44.5	44.6	44.0	44.5	41.4	46.5	47.3	47.9	41.5	45.0
19-24	25.1	29.6	29.4	25.1	27.3	26.3	27.1	26.4	29.7	24.0	26.4	26.8	27.1	26.7
25-30	12.3	15.0	14.8	14.5	13.7	10.9	13.6	12.4	12.8	13.0	10.4	14.3	11.7	12.4
21-36	1.5	0.6	1.6	3.2	2.0	0.8	1.6	0.5	1.0	1.7	1.7	1.1	1.8	1.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(342)	(321)	(310)	(311)	(256)	(266)	(1806)	(1244)	(1082)	(1207)	(1216)	(973)	(894)	(6616)

Table 38d. (cont.)

	Degree Aspirations													
	Bachelor's							Master's						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	0.8	1.2	0.8	0.6	0.4	0.9	0.8	0.9	1.4	0.6	0.6	0.1	0.7	0.7
7-12	5.5	6.1	6.5	6.3	5.8	7.5	6.3	5.2	6.3	4.7	4.2	3.6	4.6	4.8
13-18	30.1	29.1	31.9	32.5	32.3	29.8	31.0	22.7	24.9	22.8	23.0	24.1	20.4	23.0
19-24	32.8	31.7	28.4	30.2	31.0	31.7	31.0	30.1	28.0	28.2	30.7	31.8	26.8	29.3
25-30	27.1	28.1	27.7	24.9	24.3	24.6	26.1	33.6	30.9	33.6	29.0	28.4	36.2	32.0
31-36	3.7	3.9	4.8	5.5	6.3	5.4	4.9	7.6	8.4	10.1	12.5	11.9	11.5	10
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(3322)	(2647)	(2911)	(2852)	(2940)	(2846)	(17581)	(1456)	(1251)	(1258)	(1162)	(1069)	(1065)	(7261)

Table 38d. (cont.)

	Degree Aspirations													
	Professional							Other or Missing						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	1.0	1.1	0.4	0.5	0.3	0.2	0.5	2.7	2.7	1.5	1.9	0.9	1.7	1.9
7-12	3.6	5.2	3.3	4.7	4.0	4.7	4.3	13.2	15.4	11.3	10.0	10.1	14.3	12.3
13-18	22.9	21.5	24.0	25.1	22.4	20.1	22.7	42.2	35.7	43.1	42.4	43.7	35.6	40.6
19-24	24.0	27.8	26.1	27.8	26.4	27.4	26.7	25.2	28.6	21.4	28.3	24.8	28.7	26.4
25-30	36.5	29.2	33.1	27.8	31.6	34.0	32.2	14.0	15.9	16.5	13.7	16.4	17.2	15.6
31-36	10.0	15.3	13.1	14.1	15.3	13.5	13.6	2.7	1.7	4.1	3.7	4.2	2.6	3.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(1003)	(946)	(1107)	(1343)	(1240)	(1265)	(6904)	(666)	(527)	(582)	(519)	(666)	(582)	(3542)

Table 38e. Percentage Distribution of ACT Composite Scores by Degree Aspirations of ACT Testees, 1970 to 1975

	Degree Aspirations													
	Vocational/Technical							2-year						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	1.2	0.6	1.0	1.0	0.8	2.3	1.1	1.9	1.5	0.8	1.3	0.9	1.3	1.2
7-12	20.2	24.6	20.6	21.5	30.1	33.8	24.7	24.2	21.4	23.3	27.1	28.1	33.3	25.9
13-18	48.0	43.3	43.5	43.4	43.4	39.8	43.7	42.3	46.0	43.2	44.2	42.0	40.3	43.1
19-24	24.9	24.0	28.1	27.3	21.1	21.4	24.6	28.5	26.5	27.7	22.3	24.4	21.1	25.3
25-30	5.8	7.5	6.8	6.8	4.3	2.6	5.8	3.7	4.5	4.9	5.0	4.6	3.9	4.4
31-36	0.0	0.0	0.0	0.0	0.4	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(342)	(321)	(310)	(311)	(256)	(266)	(1806)	(1244)	(1082)	(1207)	(1216)	(973)	(894)	(6616)

Table 38e. (cont.)

	Degree Aspirations													
	Bachelor's							Master's						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	0.5	0.4	0.3	0.5	0.6	0.5	0.5	0.2	0.9	0.2	0.2	0.7	0.6	0.5
7-12	8.1	9.6	10.6	11.6	15.0	16.3	11.8	7.1	10.1	7.6	7.9	9.5	9.5	8.5
13-18	32.1	31.4	30.3	33.1	32.7	35.1	32.4	22.5	23.6	22.3	22.6	26.4	24.4	23.5
19-24	38.5	39.9	38.5	37.1	34.9	33.7	37.1	39.1	37.3	37.9	39.1	38.2	36.6	38.1
25-30	20.4	18.4	19.7	17.0	16.3	14.3	17.7	29.5	26.7	29.4	28.4	23.6	27.5	27.7
31-36	0.5	0.3	0.5	0.7	0.4	0.2	0.4	1.6	1.4	2.5	1.8	1.7	1.4	1.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(3322)	(2647)	(2911)	(2852)	(2940)	(2846)	(17518)	(1456)	(1251)	(1258)	(1162)	(1069)	(1065)	(7261)

Table 38e. (cont.)

	Degree Aspirations													
	Professional							Other or Missing						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	0.8	0.6	0.2	0.6	0.4	0.3	0.5	1.7	2.3	0.1	0.1	2.7	1.7	1.5
7-12	7.7	8.1	6.1	10.1	9.1	10.8	8.8	23.6	22.4	23.7	19.5	25.1	27.5	23.8
13-18	21.0	22.2	23.3	25.6	24.9	22.8	23.5	41.7	36.2	38.5	44.5	36.6	37.3	39.2
19-24	36.4	34.4	37.5	35.6	34.7	37.9	36.1	26.3	30.4	25.1	26.2	26.6	24.6	26.5
25-30	31.8	32.3	30.4	25.7	28.4	26.4	28.9	6.5	8.3	11.2	8.3	8.9	8.9	8.6
31-36	2.3	2.3	2.6	2.5	2.5	1.8	2.3	0.1	0.1	0.1	0.1	0.1	0.0	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(1003)	(946)	(1107)	(1343)	(1240)	(1265)	(6904)	(666)	(527)	(582)	(519)	(666)	(582)	(3542)

Composite scores are starting to come from this category. To be sure, students with high educational aspirations outperform those with lesser aspirations, but this pattern of decline is more evident for those with more ambitious plans than for those with less, particularly for those planning on attaining only a Bachelor's degree.

This finding fits with the data pertaining to the extent of the score decline for various levels of educational plans. On the one hand, the scores of lesser aspiring students, particularly those planning on attaining only a Bachelor's degree, are declining more rapidly than are the scores of high aspiring students (i.e., those planning on more than a Bachelor's degree). On the other hand, a propensity seems to be developing for an increased proportion of low scoring testees with plans for a terminal Bachelor's degree. Thus, the indications are that the performance of students with traditional educational plans may be more implicated in the general score decline than students of higher or lower plans.

Distribution of Test Scores by High School Grade Average

Table 39 shows the distribution of ACT-English scores by high school grades. The most interesting material in this table pertains to those students with high school GPA's of 2.51 and above. In 1970 students with GPA's between 2.51 and 3.00 constituted 26.3 percent of the sample, and contributed 11.6 percent of the very lowest English scores, 19 percent of the scores in the next-higher category, and 24.9 percent in the category above that. In 1975 students with these grades constituted a comparable 27.4 percent of the sample, but contributed 25.4 percent, 29.2 percent, and 30.6 percent to the above score categories. A similar pattern exists for students in the 3.01-3.50 and

Table 39a. Percentage Distribution of ACT English Scores by Grade Point Average of ACT Testees, 1970 to 1975

	Grade Point Average													
	0.0-0.50							0.51-1.00						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	11.8	10.2	3.5	4.4	2.6	5.0	5.7	18.9	9.1	6.8	2.2	9.8	11.8	11.0
7-12	34.7	24.8	34.5	27.2	24.5	25.0	28.1	26.3	49.1	38.6	44.4	37.8	29.4	36.5
13-18	27.8	39.4	32.7	34.8	36.2	38.0	35.0	38.9	36.4	36.4	42.2	31.1	52.9	39.0
19-24	20.1	22.6	26.3	28.5	33.6	31.0	27.8	15.8	5.5	15.9	11.1	22.2	5.9	13.2
25-30	4.9	2.9	2.3	5.1	3.1	1.0	3.1	0.0	0.0	2.3	0.0	0.0	0.0	0.3
31-36	0.6	0.0	0.6	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(144)	(137)	(171)	(158)	(229)	(200)	(1039)	(95)	(55)	(44)	(45)	(45)	(34)	(318)

Table 39a. (cont.)

	Grade Point Average													
	1.01-1.50							1.51-2.00						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	5.8	9.1	3.4	7.0	8.1	7.7	6.8	5.5	7.6	3.7	4.0	6.0	7.4	5.6
7-12	33.9	32.3	35.3	40.9	42.4	45.5	37.1	27.6	28.1	32.4	32.2	32.8	30.4	30.2
13-18	37.4	37.5	46.4	37.4	29.1	38.5	37.9	36.8	39.0	42.0	44.1	41.9	42.6	40.5
19-24	20.3	20.7	14.5	13.5	19.8	7.7	17.1	28.6	23.6	20.7	19.0	18.1	18.7	22.4
25-30	2.6	0.4	0.5	1.2	0.6	0.6	1.1	1.4	0.6	1.2	0.7	1.2	0.9	1.2
31-36	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(345)	(285)	(207)	(171)	(172)	(156)	(1336)	(1474)	(1151)	(1041)	(921)	(763)	(680)	(6030)

Table 39a. (cont.)

	Grade Point Average													
	2.01-2.50							2.51-3.00						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	3.2	3.7	1.4	2.6	3.2	3.2	2.8	1.3	1.5	0.9	0.5	1.2	2.3	1.3
7-12	18.7	20.0	21.3	22.2	24.8	27.7	22.1	11.4	10.4	12.5	13.4	15.7	18.4	13.6
13-18	33.4	37.6	37.3	42.5	41.8	43.5	38.9	25.2	31.6	31.2	38.3	37.8	39.2	33.8
19-24	41.1	36.1	36.7	31.4	28.8	24.6	33.8	54.4	49.3	48.5	42.2	40.4	36.5	45.3
25-30	3.5	2.6	3.2	1.3	1.4	1.1	2.3	7.6	7.1	6.7	5.4	4.9	3.3	5.8
31-36	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.2	0.1	0.1	0.3	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(1830)	(1450)	(1637)	(1511)	(1325)	(1201)	(8954)	(2113)	(1828)	(1940)	(2100)	(1999)	(1894)	(11874)

Table 39a. (cont.)

	Grade Point Average													
	3.01-3.50							3.51-4.00						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	0.7	0.6	0.4	0.1	0.7	0.9	0.6	0.1	0.3	0.1	0.1	0.1	0.2	0.1
7-12	5.5	5.2	6.6	6.4	7.5	8.9	6.8	2.3	1.6	2.3	2.9	3.9	3.2	2.8
13-18	13.6	20.9	24.3	26.4	29.9	31.3	22.8	10.2	12.2	12.2	15.5	18.5	20.0	15.4
19-24	62.0	55.9	54.1	55.3	50.5	49.3	54.2	54.6	57.0	53.7	55.3	55.0	55.8	55.2
25-30	17.7	17.0	14.0	11.1	11.1	9.5	13.1	31.3	27.2	28.9	23.5	20.7	19.3	24.4
31-36	0.5	0.4	0.7	0.6	0.3	0.2	0.4	1.5	1.8	2.8	2.7	1.8	9.6	2.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(1246)	(1103)	(1373)	(1384)	(1441)	(1510)	(8057)	(786)	(765)	(962)	(1113)	(1170)	(1243)	(6039)

Table 39b. Percentage Distribution of ACT Math Scores by Grade Point Average of ACT Testees, 1970 to 1975

	Grade Point Average													
	0.0-0.50							0.51-1.00						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	12.5	11.7	11.1	12.0	14.4	13.5	12.7	9.5	12.7	13.6	17.8	26.7	17.6	15.1
7-12	24.3	28.5	24.6	25.3	26.6	27.0	26.1	24.2	25.5	25.0	40.0	28.9	55.9	30.8
13-18	44.4	39.4	38.0	44.3	31.4	32.0	37.4	47.4	41.8	43.2	28.9	35.6	20.6	38.7
19-24	11.1	15.3	14.6	12.0	16.6	13.5	14.0	12.6	16.4	18.2	11.1	6.7	5.9	11.3
25-30	6.3	5.1	11.7	3.8	10.0	12.5	8.7	6.3	3.6	6.8	2.2	2.2	0.0	4.1
31-36	1.4	0.0	0.0	2.5	0.9	1.5	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(144)	(137)	(171)	(158)	(229)	(200)	(1039)	(95)	(55)	(44)	(45)	(45)	(34)	(318)

Table 39b. (cont.)

	Grade Point Average													
	1.01-1.50							1.51-2.00						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	5.2	10.9	6.8	12.3	26.2	19.9	12.0	6.3	8.9	8.9	13.4	18.6	16.6	11.0
7-12	23.8	25.3	32.9	33.9	36.0	35.9	29.8	21.4	22.3	23.7	30.6	32.1	33.8	26.1
13-18	47.5	45.3	42.0	41.5	25.6	31.4	40.7	45.7	43.6	43.9	38.9	32.5	32.2	40.8
19-24	17.7	14.7	13.5	11.1	9.3	5.8	13.1	18.0	18.2	15.4	12.3	10.2	13.2	15.2
25-30	5.5	3.9	4.8	1.2	2.9	7.1	4.4	8.0	7.0	7.8	4.8	6.4	4.1	6.6
31-36	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.5	0.1	0.3	0.1	0.1	0.0	0.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(345)	(285)	(207)	(171)	(172)	(156)	(1336)	(1474)	(1151)	(1041)	(921)	(763)	(680)	(6030)

Table 39b. (cont.)

	Grade Point Average													
	2.01-2.50							2.51-3.00						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	5.1	5.7	5.2	7.4	13.8	13.3	8.0	2.4	3.8	3.4	4.5	9.3	7.7	5.2
7-12	15.9	18.7	16.7	23.4	23.1	25.6	20.1	9.7	10.4	11.9	17.0	17.3	19.9	14.4
13-18	38.8	40.9	42.5	39.6	37.7	34.0	39.1	32.1	35.1	34.8	36.0	32.8	33.3	34.0
19-24	24.9	21.0	21.1	19.4	15.5	16.2	20.1	27.9	25.8	23.4	23.0	21.5	23.2	24.1
25-30	14.4	12.8	13.5	9.8	9.7	10.6	12.0	25.2	22.4	24.5	18.4	18.4	14.8	20.6
31-36	1.0	1.0	0.9	0.5	0.2	0.2	0.7	2.7	2.5	1.9	1.2	0.8	1.1	1.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(1830)	(1450)	(1637)	(1511)	(1325)	(1201)	(8954)	(2113)	(1828)	(1940)	(2100)	(1999)	(1894)	(11874)

Table 39b. (cont.)

	Grade Point Average													
	3.01-3.50							3.51-4.00						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	1.0	1.5	1.3	2.0	3.5	4.2	2.3	0.4	0.9	0.5	1.0	1.7	1.0	1.0
7-12	5.1	4.4	7.1	9.5	11.2	11.9	8.5	3.3	2.1	2.5	3.5	5.2	5.7	3.9
13-18	19.3	23.8	23.6	24.1	25.1	26.4	23.8	10.6	11.9	12.5	14.6	16.6	18.5	14.6
19-24	25.0	25.5	24.0	28.1	23.5	25.3	25.2	18.1	22.5	18.4	19.9	19.9	22.8	20.4
25-30	39.2	35.9	39.0	31.7	33.4	29.3	34.5	45.4	44.6	47.7	45.3	45.3	41.8	44.9
31-36	10.5	9.0	5.0	4.6	3.3	3.0	5.7	22.3	18.0	18.4	15.7	11.3	10.1	15.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(1246)	(1103)	(1373)	(1384)	(1441)	(1510)	(8057)	(786)	(765)	(962)	(1113)	(1170)	(1243)	(6039)

Table 39c. Percentage Distribution of ACT Social Studies Scores by Grade Point Average of ACT Testees, 1970 to 1975

	Grade Point Average													
	0.0-0.50							0.51-1.00						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	16.0	10.2	16.4	21.5	10.9	8.0	13.5	13.7	16.4	15.9	22.2	17.8	14.7	16.4
7-12	27.8	32.8	30.4	27.2	30.1	41.5	31.9	41.1	41.8	34.1	44.4	44.4	44.1	41.5
13-18	25.0	20.4	17.0	12.7	21.4	19.5	19.3	23.2	12.7	18.2	13.3	24.4	35.3	20.8
19-24	18.8	27.7	24.6	25.3	24.0	20.0	23.3	16.8	23.6	18.2	17.8	13.3	2.9	16.3
25-30	9.0	8.0	10.5	11.4	13.1	10.5	10.7	5.3	5.5	13.6	2.2	0.0	2.9	5.0
31-36	3.5	0.7	1.2	1.9	0.4	1.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(144)	(137)	(171)	(158)	(229)	(200)	(1039)	(95)	(55)	(44)	(45)	(45)	(34)	(318)

Table 39c. (cont.)

	Grade Point Average													
	1.01-1.50							1.51-2.00						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	9.9	9.5	14.5	20.5	23.8	21.2	15.0	10.1	11.7	11.0	15.6	16.5	14.9	12.8
7-12	34.8	38.2	42.5	32.2	37.8	48.1	38.3	28.2	30.9	35.4	35.5	41.0	44.3	34.5
13-18	25.2	23.5	19.3	24.0	14.0	12.2	20.8	26.7	24.2	23.1	20.5	20.6	20.3	23.2
19-24	22.3	23.2	13.3	18.1	15.7	14.1	19.7	26.2	24.3	21.7	23.5	15.5	16.3	22.2
25-30	7.8	5.6	4.3	5.3	7.6	4.5	6.1	8.3	8.5	8.6	4.7	6.3	4.1	7.1
31-36	0.0	0.0	0.0	0.0	1.2	0.0	0.1	0.5	0.3	0.2	0.2	0.1	0.1	0.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(345)	(285)	(207)	(171)	(172)	(156)	(1336)	(1474)	(1151)	(1041)	(921)	(763)	(680)	(6030)

Table 39c. (cont.)

	Grade Point Average													
	2.01-2.50							2.51-3.00						
Year	1970	1971	1972	1973	1o74	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	5.5	6.3	6.8	8.6	10.6	9.3	7.7	3.1	3.3	4.3	5.6	7.6	5.1	4.8
7-12	24.0	23.9	29.0	28.8	34.1	42.1	29.6	14.5	16.9	21.9	21.9	25.0	30.3	21.7
13-18	25.0	23.9	20.2	21.9	22.5	21.1	22.5	20.1	18.1	19.4	19.4	21.9	26.1	20.8
19-24	30.3	31.5	28.4	29.3	22.7	18.7	27.3	37.1	37.3	31.1	33.0	29.6	25.1	32.2
25-30	14.6	14.0	14.7	10.8	9.9	8.7	12.4	24.1	23.4	22.1	19.2	14.8	12.7	19.4
31-36	0.5	0.4	0.9	0.7	0.2	0.0	0.5	1.1	1.1	1.2	1.0	1.2	0.7	1.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(1830)	(1450)	(1637)	(1511)	(1325)	(1201)	(8954)	(2113)	(1828)	(1940)	(2100)	(1999)	(1894)	(11874)

Table 39c. (cont.)

	Grade Point Average													
	3.01-3.50							3.51-4.00						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	1.7	1.2	2.5	3.3	2.6	2.7	2.4	0.9	1.2	0.8	1.3	1.9	0.8	1.2
7-12	7.9	10.0	13.0	14.1	17.3	20.1	14.1	3.1	4.8	4.7	7.5	8.1	10.1	6.8
13-18	12.5	13.6	14.9	14.7	18.1	21.1	16.1	9.8	8.8	9.4	7.7	11.7	16.3	10.9
19-24	35.0	32.9	32.7	32.9	32.9	30.5	32.7	29.5	26.7	28.9	29.9	31.2	30.4	29.6
25-30	39.2	38.9	34.3	32.4	25.3	24.2	31.9	48.3	50.2	47.3	45.3	39.6	36.4	43.7
31-36	3.8	3.4	2.5	2.7	3.7	1.3	2.8	8.4	8.4	8.9	8.2	7.5	6.0	7.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(1246)	(1103)	(1373)	(1384)	(1461)	(1510)	(8057)	(786)	(765)	(962)	(1113)	(1170)	(1243)	(6039)

Table 39d. Percentage Distribution of ACT Natural Science Scores by Grade Point Average of ACT Testees, 1970 to 1975

	Grade Point Average													
	0.00-0.51							0.51-1.00						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	4.9	10.9	2.9	3.8	1.3	1.0	3.7	5.3	7.3	6.8	2.2	4.4	0.0	4.7
7-12	21.5	13.1	14.6	18.4	9.2	13.0	14.4	16.8	14.5	9.1	22.2	22.2	32.4	18.5
13-18	41.7	38.0	43.3	41.8	44.5	37.5	41.3	50.5	54.5	40.9	57.8	51.1	55.9	51.6
19-24	18.1	23.4	19.3	23.4	24.0	28.5	23.1	20.0	16.4	29.5	15.6	13.3	11.8	18.2
25-30	9.7	14.6	18.1	10.1	18.3	17.0	15.1	7.4	7.3	6.8	2.2	6.7	0.0	5.7
31-36	4.2	0.0	1.8	2.5	2.6	3.0	2.5	0.0	0.0	6.8	0.0	2.2	0.0	1.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(114)	(137)	(171)	(158)	(229)	(200)	(1039)	(95)	(55)	(44)	(45)	(45)	(34)	(318)

Table 39d. (cont.)

	Grade Point Average													
	1.01-1.50							1.51-2.00						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	3.2	1.4	1.4	1.8	0.6	3.2	2.0	1.7	2.7	1.8	1.5	1.2	1.9	1.8
7-12	15.9	16.1	15.0	18.7	20.3	25.0	17.8	13.0	14.1	13.5	14.2	13.9	16.9	14.0
13-18	44.3	44.9	48.8	50.3	43.0	42.9	35.6	45.0	38.8	49.3	50.2	49.9	43.4	45.8
19-24	23.5	27.7	26.1	18.7	20.3	14.7	22.7	27.2	30.2	21.8	23.2	24.2	27.2	25.8
25-30	11.6	9.5	8.7	9.4	13.4	12.8	10.8	11.8	13.2	12.3	9.7	9.2	9.6	11.3
31-36	1.4	0.4	0.0	1.2	2.3	1.3	1.0	1.2	1.0	1.2	1.2	1.6	1.0	1.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(345)	(285)	(207)	(171)	(172)	(156)	(1336)	(1474)	(1151)	(1041)	(921)	(763)	(680)	(6030)

Table 39d. (cont.)

	Grade Point Average													
	2.01-2.50							2.51-3.00						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	1.8	1.5	1.1	0.7	0.7	1.9	1.3	0.7	1.1	0.7	0.7	0.5	0.9	0.8
7-12	9.0	9.7	8.9	10.1	8.5	11.4	9.5	5.1	6.4	6.3	6.6	5.3	8.8	6.4
13-18	38.9	39.9	42.3	41.8	43.0	43.0	41.3	29.9	28.5	33.1	34.2	35.4	31.1	32.1
19-24	31.1	30.3	27.1	29.9	30.7	26.4	29.3	33.6	33.2	29.6	32.1	32.6	34.5	32.6
25-30	17.2	17.2	18.1	15.5	14.6	15.2	16.4	27.5	26.5	26.0	21.9	21.7	21.[illegible]	24.2
31-36	[illegible]	1.2	2.5	2.1	2.6	2.1	2.1	3.3	4.3	4.3	4.6	4.6	3.0	4.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(1830)	(1450)	(1637)	(1511)	(1325)	(1201)	(8954)	(2113)	(1828)	(1940)	(2100)	(1999)	(1894)	(11874)

Table 39d. (cont.)

	Grade Point Average													
	3.01-3.50							3.51-4.00						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	0.3	0.6	.5	0.2	0.1	0.5	0.4	0.1	0.4	0.2	0.1	0.1	0.2	0.2
7-12	1.8	3.1	3.9	3.0	2.4	4.7	3.2	1.3	2.5	1.0	1.3	1.5	1.9	1.6
13-18	16.4	18.8	21.6	22.4	24.8	21.3	21.1	10.6	11.4	9.7	14.7	12.1	10.6	11.6
19-24	29.9	29.8	28.8	32.	30.2	31.1	30.5	22.0	22.9	25.8	24.1	25.6	24.5	24.3
25-30	43.6	38.3	36.8	31.6	33.0	34.0	36.0	49.6	41.	42.4	36.8	0.5	42.3	41.4
31-36	8.0	9.3	8.4	10.1	9.4	8.4	8.9	16.4	21.4	20.9	23.0	22.2	20.5	20.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(1246)	(1103)	(1373)	(1384)	(1441)	(1510)	(8057)	(786)	(765)	(962)	(1113)	(1170)	(1243)	(6039)

Table 39e. Percentage Distribution of ACT Composite Scores by Grade Point Average of ACT Testees, 1970 to 1975

	Grade Point Average													
	0.00-0.50							0.51-1.00						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	5.6	5.1	1.2	2.5		2.5	3.0	4.2	1.8	2.3	0.0	4.4	2.9	2.8
7-12	34.7	26.3	32.2	32.3	26.2	29.0	29.8	36.8	43.6	34.1	60.0	44.4	52.9	43.7
13-18	38.2	40.1	35.7	33.5	38.9	35.5	37.0	44.2	38.2	40.9	28.9	37.8	38.2	39.0
19-24	16.0	24.8	23.4	24.7	24.0	25.5	23.3	13.7	14.5	11.4	11.1	11.1	5.9	12.0
25-30	4.2	3.6	7.0	6.3	8.7	7.0	6.4	1.1	1.8	11.4	0.0	2.2	0.0	2.5
31-36	1.4	0.0	0.6	0.6	0.0	0.5	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(114)	(137)	(171)	(158)	(229)	(200)	(1039)	(95)	(55)	(44)	(45)	(45)	(34)	(318)

Table 39e. (cont.)

	Grade Point Average													
	1.01-1.50							1.51-2.00						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	2.3	1.1	1.0	2.9	3.5	1.9	2.0	0.8	2.1	1.0	2.0	2.5	1.8	1.6
7-12	29.3	30.5	34.8	36.3	45.9	51.9	36.1	23.3	26.8	26.5	31.9	36.6	39.0	29.3
13-18	44.3	44.9	44.4	43.3	33.7	30.1	41.3	47.6	43.5	45.4	46.5	41.8	39.4	44.6
19-24	20.9	22.1	18.8	15.2	14.0	14.1	18.4	23.8	24.4	23.4	16.9	16.1	17.9	21.2
25-30	3.2	1.4	1.0	2.3	2.9	1.9	2.2	4.5	3.2	3.7	2.7	3.0	1.8	3.3
31-36	0.0	0.0	0.0	0.0	0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(345)	(285)	(207)	(171)	(172)	(156)	(1336)	(1474)	(1151)	(1041)	(921)	(763)	(680)	(6030)

Table 39e. (cont.)

	Grade Point Average													
	2.01-2.50							2.51-3.00						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	1.0	0.9	0.5	0.7	1.0	1.2	0.9	0.3	0.4	0.2	0.5	0.6	0.7	0.4
7-12	14.3	16.2	15.1	19.6	23.5	29.8	19.1	6.5	8.2	10.3	11.3	15.2	16.9	11.4
13-18	40.8	42.5	42.4	44.8	44.5	40.7	42.3	29.9	31.1	31.4	35.7	36.0	38.5	33.8
19-24	35.0	33.2	33.2	29.2	26.1	22.4	30.4	44.9	43.3	42.2	39.8	36.9	35.3	40.4
25-30	8.8	7.2	8.4	5.8	4.9	5.8	7.0	18.3	16.7	15.6	12.7	11.1	8.6	13.9
31-36	0.1	0.0	0.3	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.0	0.3	0.1	0.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(1830)	(1450)	(1637)	(1511)	(1325)	(1201)	(8954)	(2113)	(1828)	(1940)	(2100)	(1999)	(1894)	(11874)

Table 39e. (cont.)

	Grade Point Average													
	3.01-3.50							3.51-4.00						
Year	1970	1971	1972	1973	1974	1975	Total	1970	1971	1972	1973	1974	1975	Total
Score Interval														
0-6	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.2	0.1	0.1
7-12	3.0	2.8	5.5	5.1	5.8	7.9	5.2	1.4	1.8	1.5	1.6	3.0	2.3	2.0
13-18	14.6	18.5	20.0	23.7	25.7	27.8	22.1	7.6	9.4	8.7	11.9	13.1	15.4	11.6
19-24	41.5	41.7	41.6	43.1	43.3	41.0	42.0	33.7	33.3	33.3	34.4	35.8	37.3	34.9
25-30	39.8	35.6	32.0	27.1	24.4	22.8	30.0	51.9	51.2	50.6	46.5	43.7	42.0	47.0
31-36	1.0	1.3	0.7	1.0	0.6	0.3	0.8	5.3	4.2	5.9	5.6	4.3	2.9	4.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(N)	(1246)	(1103)	(1373)	(1384)	(1441)	(1510)	(8057)	(786)	(765)	(962)	(1113)	(1170)	(1243)	(6039)

3.51-4.00 ranges, although this is less striking since the proportion of students in these two categories has increased more rapidly than has that for the category 2.51-3.00.

Apparently students with currently lofty high school GPA's no longer have a stranglehold on the highest English scores, and can no longer avoid the possibility of low English scores. The inference is that students receiving equal GPA's in 1970 and in 1975 are not equally able academically, at least to the extent that this ability is captured by the test. This finding suggests the following interpretation: It may be reasoned that since high school grades have risen in the last several years, and since it can plausibly be argued that a large part of a student's perception of his academic ability derives from the grades he receives, then perhaps this grade inflation has resulted in a larger proportion of less able students now perceiving themselves as "college material." This would lead them to aspire to college, to write ACT-Assessments, probably to do poorly on the tests, and thus contribute to the decline.

One can draw similar conclusions about the other examinations. Students with impressive high school GPA's are yearly contributing a greater proportion of scores to the lower end of the distribution. This pattern is even evident for the otherwise stable distribution of Natural Science scores. The proper interpretation seems to be that there has been a general inflation of grades in high school--that is, that the curve has simply moved to the right--and that as a result high school students who appear to be the highest achievers no longer have a monopoly on the highest scores. If one doubts this, observe

that while the percentage of students with GPA's of 3.50-4.00 nearly doubled between 1970 and 1975, the percentage of very high Composite scores (those in the 30-36 range) attained by this select group increased by only 25 percent.[17]

A Model of the Score Decline

The analyses reported thus far have demonstrated the dimensions of the score decline for various subpopulations of testees. They have indicated where the declines are steepest, where they are less marked, and have often suggested tentative explanations for the general score decline. For the most part, however, these analyses have involved only bivariate techniques. The next section of this study will utilize multivariate techniques to address the score decline.

The final stage of the statistical analyses involved the use of multiple regression, in which a number of models were specified regressing the five kinds of test scores on various independent variables. The idea is not so much to model the process of test score attainment (i.e., the specification of models with various intervening variables hypothesized to mediate the effects of the exogenous variables) as to simply assess the direct effect of a selected number of predetermined variables.

Procedures

Multiple regression is by now well known throughout the research

[17] One can certainly discuss the constraints imposed here by ceiling effects, but this does not mitigate similar, if less impressive, results elsewhere in the data.

literature, and there is no need to exhaustively explain the technique here.[18] For the most part the regressions used in this study are simple applications of the general linear model, $Y=a+bX+e$. Several of the independent variables to be used are dummies, which presents no problem as long as one remembers to impose the constraint on the parameters of the regression equation that one of the dummy variables will be omitted from the equation. Following an example from Suits (1957), we may define three dummy variables, R_1, R_2, and R_3, with the property that $R_i=1$ if the item belongs to the ith category; otherwise $R_i=0$. Suits observes that the natural tendency is to specify the model as:

$$Y = aX + b_{11}R_1 + b_{12}R_2 + b_{13}R_3 + c_1 + u.$$

This is clearly wrong in that the optimum estimates of c_1 and the b_{1i} are indeterminate. The basic problem is that there is perfect linear multiple correlation among the R_i. A useful solution to this can be obtained by simply dropping one of the dummies from the equation. Thus,

$$Y = aX + b_{31}R_1 + b_{32}R_2 + c_3 + u.$$

This allows one to obtain determinate estimates of the parameters, since the values of R_3 are identically derivable from R_1 and R_2.[19]

In the present study, cohort effects are coded as a series of dummies. The first year of the sample, 1970, is coded as the omitted

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[18] For a comprehensive treatment of multiple regression, see Kerlinger and Pedhazur, 1973.

[19] Alternatively, one could set the constant term of the equation to zero (i.e., $Y = aX + b_{21}R_1 + b_{22}R_2 + b_{23}R_3 + u$), but this has not been done here.

category. Thus, cohort effects can be interpreted as deviations from the 1970 mean.

A second aspect of the regression equations that is potentially problematic is the inclusion of interaction terms. Again, these need create no problems. As Kerlinger and Pedhazur (1973) have noted, "The concept of interaction is probably best understood when viewed from the frame of reference of prediction. In order to minimize errors of prediction, is it necessary to resort to terms other than the main effects?" (p. 181)

The only interaction terms considered here are those between cohort and sex. These new variables were created simply by multiplying together the sex and cohort variables. The procedure may be shown as follows:

X_1 = 1 if male, 0 if female

X_2 = 1 if 1971, 0 if otherwise

X_3 = 1 if 1972, 0 if otherwise

X_4 = 1 if 1973, 0 if otherwise

X_5 = 1 if 1974, 0 if otherwise

X_6 = 1 if 1975, 0 if otherwise

$X_7 = X_1X_2$

$X_8 = X_1X_3$

$X_9 = X_1X_4$

$X_{10} = X_1X_5$

$X_{11} = X_1X_6$

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + b_{10}X_{10} + b_{11}X_{11} + e.$$

The parameters of the equation are thus:

$a = E[Y/\text{females in } 1970]$

$a + b_1 = E[Y/\text{males in } 1970]$

$a + b_2 = E[Y/\text{females in } 1971]$

$a + b_1 + b_2 + b_7 = E[Y/\text{males in } 1971]$

$a + b_3 = E[Y/\text{females in } 1972]$

$a + b_1 + b_3 + b_8 = E[Y/\text{males in } 1972]$

$a + b_4 = E[Y/\text{females in } 1973]$

$a + b_1 + b_4 + b_9 = E[Y/\text{males in } 1973]$

$a + b_5 = E[Y/\text{females in } 1974]$

$a + b_1 + b_5 + b_{10} = E[Y/\text{males in } 1974]$

$a + b_6 = E[Y/\text{females in } 1975]$

$a + b_1 + b_6 + b_{11} = E[Y/\text{males in } 1975]$

These parameters allow one to estimate whether or not the effect of being of a given sex and of being in a given cohort contributes significantly to the predictive power of the model. In view of the changing composition of the test-taking population, these interactions are potentially important.

Results of the Regression Analysis

Most of the following discussion will be set in terms of models in which the dependent variable is the ACT-Composite score. The effects of predetermined variables operate similarly though not identically in each of the four exams. While the most glaring discrepancies will be noted in this discussion, focusing on the Composite regressions should serve to keep the presentation reasonably direct. We will first specify and estimate the more restricted

six-year model; and then proceed to the more fully specified three-year model.

Results of Six-Year Model

Table 40 indicates the effects of cohort on the Composite score. Basically, this is simply a way to map out the yearly means. The constant term corresponds to the 1970 mean, and the B's correspond to deviations from that mean.

While entering sex into the equation leaves the cohort effects essentially unchanged, including the sex by cohort interaction terms indicates that the cohort effects were being suppressed somewhat in the first equation. In fact, an apparently positive B in 1972 changes sign when these interactions are controlled. The effects of the interactions are essentially the same from 1972 to 1975, and considerably smaller in 1971. These results thus provide some support for the thesis that the declines are partly attributable to the changing sex-composition of the sample.

The regression of ACT-Composite on high school average, educational plans, race, and high school size yields no great surprises (see Table 41). Race and high school grade average both exert large effects,[20] educational plans a bit less, and high school size, as expected, has a relatively minor effect. Adding sex to the equation adds significantly to the adjusted R^2, and also leads to an increase

[20] Which of these two is exerting the most effect depends on whether one wants to consider B's or Betas. Certainly strong and consistent arguments can be developed for using either parameter. The choice is largely a matter of the problem at hand. For this analysis, focusing attention on the B's seems most appropriate.

Table 40. Regression of ACT Composite Scores on Cohort and Sex by Cohort Interactions, 1970 to 1975

Independent Variables	(1) B	(1) SE(B)	(2) B	(2) SE(B)	(3) B	(3) SE(B)
Constant	19.961		19.355		19.677	
YR71	-.167	.116	-.162	.115	-.400	.162
YR72	.260	.114	.276	.113	-.164	.159
YR73	-.284	.122	-.287	.121	-.780	.172
YR74	-.511	.124	-.489	.123	-.903	.173
YR75	-.764	.124	-.723	.124	-1.167	.172
SEX			1.206	.071	.566	.157
SEX71					.474	.230
SEX72					.884	.226
SEX73					.981	.242
SEX74					.831	.247
SEX75					.904	.248
R^2	.003		.015		.015	
Error of Estimate	5.614		5.582		5.580	

Table 41. Regression of ACT Composite Scores on Background, Cohort, and Sex by Cohort Interactions, 1970 to 1975

Independent Variables	(1) B	(1) SE(B)	(2) B	(2) SE(B)	(3) B	(3) SE(B)	(4) B	(4) SE(B)
Constant	2.690		1.532		1.812		1.988	
HSA	3.771	.042	4.019	.042	4.187	.042	4.183	.042
EDPLANS	2.423	.068	2.092	.068	2.083	.067	2.084	.067
RACE	4.836	.083	4.678	.082	4.522	.081	4.521	.081
HSSIZE	.442	.056	.452	.055	.808	.056	.808	.056
SEX			1.701	.056	1.713	.055	1.382	.120
YR71					-.336	.087	-.485	.123
YR72					-.313	.086	-.546	.121
YR73					-.944	.094	-1.164	.132
YR74					-1.676	.096	-1.926	.133
YR75					-2.116	.096	-2.298	.132
SEX71							.298	.174
SEX72							.470	.172
SEX73							.438	.184
SEX74							.507	.188
SEX75							.366	.188
R^2	.394		.415		.432		.432	
Error of Estimate	4.378		4.300		4.240		4.239	

in the effect of high school average. This effect is underlined even more with the addition of cohort effects to the model.

Two things seem to be occurring here. First, the effects of being in a particular cohort are greatly suppressed when these five background measures are not controlled. Controlling for these variables, the effects of being in a particular cohort are more substantial. Second, these equations provide fairly compelling evidence for the presence of a general high school grade inflation. While high school grades are rising, this has not been accompanied by a corresponding increase in test scores. The adjusted trend clearly differs from the observed trend.

Finally, the sex by cohort interactions were entered into the equation. Net of the variables already in the equation, the influence of these variables is not great. They serve to attenuate the sex main effect by about 20 percent, and slightly increase the cohort effects.

Tables 42 to 49 show the relationships for English, Math, Social Studies, and Natural Science courses. Examining these results reveals certain dissimilarities in the parameters of the different models. When ACT-English scores are used as the dependent variable, the effect of sex net of cohort effects is negative, reflecting the fact that women outperform men on the English exam. Following the English equations through indicates that English scores are not as highly determined by the vector of background variables including high school average, educational plans, race, high school size, and sex as are Composite scores (compare the Composite adjusted R^2 of .415 to the English

Table 42. Regression of ACT-English Scores on Cohort and Sex by Cohort Interactions, 1970 to 1975

Independent Variable	(1) B	(1) SE(B)	(2) B	(2) SE(B)	(3) B	(3) SE(B)
Constant	18.654		19.409		19.692	
YR71	-.290	.108	-.298	.107	-.530	.151
YR72	.260	.106	.240	.105	-.205	.148
YR73	-.325	.114	-.322	.112	-.675	.159
YR74	-.368	.116	-.394	.115	-.684	.161
YR75	-.608	.116	-.660	.115	-1.110	.160
SEX			-1.503	.066	-2.068	.146
SEX71					.462	.213
SEX72					.896	.210
SEX73					.702	.225
SEX74					.576	.229
SEX75					.920	.230
R^2	.003		.023		.024	
Error of Estimate	5.242		5.188		5.186	

Table 43. Regression of ACT-English Scores on Background, Cohort, and Sex by Cohort Interactions, 1970 to 1975.

Independent Variables	(1) B	(1) SE(B)	(2) B	(2) SE(B)	(3) B	(3) SE(B)	(4) B	(4) SE(B)
Constant	4.255		5.024		5.285		5.452	
HSA	3.305	.042	3.140	.043	3.264	.043	3.259	.043
EDPLANS	1.357	.068	1.577	.068	1.569	.068	1.570	.068
RACE	4.162	.083	4.267	.082	4.152	.082	4.155	.082
HSSIZE	0.192	.056	0.185	.055	0.447	.057	0.477	.057
SEX			-1.129	.056	-1.120	.056	-1.438	.122
YR71					-.432	.088	-.592	.125
YR72					-.220	.087	-.505	.122
YR73					-.733	.095	-.854	.133
YR74					-1.248	.097	-1.409	.134
YR75					-1.673	.097	-1.914	.133
SEX71							.320	.176
SEX72							.586	.174
SEX73							.244	.186
SEX74							.324	.189
SEX75							.495	.190
R^2	.313		.324		.334		.335	
Error of Estimate	4.351		4.316		4.282		4.281	

Table 44. Regression of ACT-Math on Cohort and Sex by Cohort Interactions, 1970 to 1975

Independent Variables	(1) B	(1) SE(B)	(2) B	(2) SE(B)	(3) B	(3) SE(B)
Constant	19.932		18.616		18.896	
YR71	-.233	.151	-.220	.148	-.436	.209
YR72	.295	.148	.330	.146	-.009	.205
YR73	-.589	.158	-.595	.156	-1.010	.221
YR74	-1.041	.162	-.994	.159	-1.283	.223
YR75	-1.344	.162	-1.253	.160	-1.776	.222
SEX			2.621	.092	2.063	.203
SEX71					.428	.296
SEX72					.677	.291
SEX73					.826	.312
SEX74					.575	.318
SEX75					1.076	.318
R^2	.006		.038		.038	
Error of Estimate	7.314		7.196		7.195	

Table 45. Regression of ACT-Math Scores on Background, Cohort, and Sex by Cohort Interactions, 1970 to 1975

Independent Variables	(1) B	(1) SE(B)	(2) B	(2) SE(B)	(3) B	(3) SE(B)	(4) B	(4) SE(B)
Constant	-.159		-2.409		-2.000		-1.902	
HSA	4.510	.059	4.992	.058	5.245	.058	5.242	.058
EDPLANS	3.008	.095	2.366	.093	2.347	.091	2.350	.091
RACE	4.845	.116	4.538	.112	4.290	.111	4.289	.111
HSSIZE	.534	.078	.554	.075	1.104	.077	1.104	.077
SEX			3.303	.077	3.325	.076	3.142	.164
YR71					-.446	.119	-.558	.168
YR72					-.406	.117	-.486	.165
YR73					-1.555	.128	-1.666	.180
YR74					-2.538	.131	-2.621	.181
YR75					-3.060	.131	-3.282	.180
SEX71							.224	.238
SEX72							.180	.235
SEX73							.322	.251
SEX74							.166	.256
SEX75							.398	.257
R^2	.308		.356		.378		.378	
Error of Estimate	6.099		5.884		5.786		5.786	

Table 46. Regression of ACT-Social Studies Scores on Cohort and Sex by Cohort Interactions, 1970 to 1975

Independent Variables	(1) B	(1) SE(B)	(2) B	(2) SE(B)	(3) B	(3) SE(B)
Constant	19.544		18.772		19.172	
YR71	-.167	.148	-.160	.148	-.317	.209
YR72	-.079	.146	-.058	.145	-.654	.204
YR73	-.581	.156	-.584	.155	-1.174	.220
YR74	-1.291	.160	-1.263	.159	-1.974	.222
YR75	-1.584	.160	-1.531	.159	-2.031	.221
SEX			1.537	.091	.739	.202
SEX71					.308	.295
SEX72					1.198	.290
SEX73					1.174	.311
SEX74					1.437	.317
SEX75					1.011	.318
R^2	.007		.018		.019	
Error of Estimate	7.214		7.173		7.169	

Table 47. Regression of ACT-Social Studies Scores on Background, Cohort, and Sex by Cohort Interactions, 1970 to 1975

Independent Variables	(1) B	(1) SE(B)	(2) B	(2) SE(B)	(3) B	(3) SE(B)	(4) B	(4) SE(B)
Constant	.921		-.429		-.037		.218	
HSA	3.769	.060	4.057	.060	4.302	.060	4.294	.060
EDPLANS	2.938	.096	2.552	.096	2.541	.095	2.546	.095
RACE	5.571	.117	5.386	.116	5.173	.115	5.174	.115
HSSIZE	.428	.079	.440	.078	.938	.080	.936	.080
SEX			1.982	.080	1.998	.079	1.523	.171
YR71					-.332	.124	-.390	.175
YR72					-.664	.122	-1.004	.172
YR73					-1.246	.133	-1.539	.187
YR74					-2.512	.136	-3.054	.188
YR75					-2.992	.136	-3.226	.187
SEX71							.113	.247
SEX72							.767	.244
SEX73							.587	.261
SEX74							1.105	.266
SEX75							.471	.267
R^2	.271		.289		.309		.310	
Error of Estimate	6.179		6.103		6.015		6.013	

Table 48. Regression of ACT-Natural Science Scores on Cohort and Sex by Cohort Interactions, 1970 to 1975

Independent Variables	(1) B	(1) SE(B)	(2) B	(2) SE(B)	(3) B	(3) SE(B)
Constant	21.247		20.150		20.478	
YR71	.007	.130	.017	.128	-.359	.181
YR72	.528	.128	.557	.126	.158	.178
YR73	.343	.137	.338	.135	-.286	.192
YR74	.614	.140	.652	.138	.292	.193
YR75	.462	.140	.537	.138	.240	.192
SEX			2.184	.079	1.531	.176
SEX71					.751	.256
SEX72					.799	.252
SEX73					1.239	.270
SEX74					.721	.276
SEX75					.587	.277
R^2	.001		.031		.032	
Error of Estimate	6.327		6.233		6.230	

Table 49. Regression of ACT-Natural Science Scores on Background, Cohort, and Sex by Cohort Interactions, 1970 to 1975

Independent Variables	(1) B	(1) SE(B)	(2) B	(2) SE(B)	(3) B	(3) SE(B)	(4) B	(4) SE(B)
Constant	5.324		3.513		3.584		3.771	
HSA	3.483	.052	3.871	.051	3.922	.052	3.923	.052
EDPLANS	2.380	.084	1.863	.082	1.861	.082	1.857	.082
RACE	4.767	.102	4.520	.099	4.471	.100	4.465	.100
HSSIZE	.601	.069	.617	.069	.730	.069	.731	.069
SEX			2.659	.068	2.661	.068	2.302	.148
YR71					-.146	.107	-.440	.151
YR72					.005	.106	-.202	.149
YR73					-.251	.115	-.613	.162
YR74					-.441	.117	-.649	.163
YR75					-.748	.118	-.798	.162
SEX71							.587	.214
SEX72							.414	.211
SEX73							.718	.226
SEX74							.416	.230
SEX75							.078	.231
R^2	.281		.32		.324		.324	
Error of Estimate	5.369		5.		5.206		5.205	

adjusted R^2 of .324). Adding cohort effects and sex by cohort interactions produces similar results in the English equations as in the Composite equations.

Turning now to the Math equations, one first notices here that sex is a more important predictor here than in the Composite equations, but that the sex by cohort interactions (net of cohort effects and the sex main effect) makes somewhat less difference in determining Math scores. The inclusion of these interactions is still extremely important, in that without them the fact that reduced form cohort effects are being suppressed tends to be obscured.

As with English scores, Math scores are a bit less highly determined by the background variables than are Composite scores. Controlling for background variables increases the magnitude of the cohort effects, and a general inflation of high school average is indicated. Net of background and cohort, the addition of sex by cohort interactions adds little to the model.

While the declines on the Social Studies exam are far steeper than those on the Composite, the parameters associated with sex and sex by cohort interactions are similar between the two tests, although they are in general somewhat larger in the Social Studies equations. Examination of these equations essentially mirrors the previously cited patterns.

Equations pertaining to Natural Science scores are slightly more difficult to interpret, in that these scores have not declined over time. Still, adjusting for sex and sex by cohort interactions reveals that the adjusted means are clearly different from the observed means.

This tendency is even more marked when cohort effects are considered net of background and sex by cohort interactions.

What have the regression equations shown us thus far? A few points stand out. First, test scores can be predicted reasonably well given the five background variables available for all six years, even given the relative unimportance of high school size. Second, the dimensions of the observed declines in test scores are obscured somewhat by changes taking place in the population. Specifically, high school average is increasing and the sex composition is changing. Controlling for these measures indicates that the reduced form cohort effects are considerably underestimated.

These results also suggest that while race is a major determinant of test scores, it is probably not implicated to any appreciable extent in the general score decline in test scores. On the basis of the preceding equations, it is more plausible to assert that the increased proportion of women is contributing significantly to the decline, and that the general grade inflation also has had an impact. As suggested earlier, this can possibly be explained as a social-psychological process. If relatively "untalented" students are achieving better high school grades, they are more likely to perceive themselves as good students, to aspire to college, to take the college entrance exams, and to do poorly. This might well be one of the major causal factors in the decline.

Results of Three-Year Model

A second series of equations was estimated for the most recent three years of the sample for which more complete data were available.

Again, the Composite models will be considered most extensively, and departures from these patterns for the other exams will subsequently be noted.

Table 50 shows the results of similar equations to those discussed previously. These map the means over time, and show the means adjusted for cohort effects and sex by cohort interactions.

In the next equation, ACT-Composite was regressed on sex, high school average, educational plans, race, and high school size (see Table 51). Except for a somewhat smaller effect of race for the 1973-1975 population than the 1970-1975 population, these variables operate similarly in the six-year and three-year models.

In the next step, additional demographic and school-related variables were introduced into the equation. These include size of the student's home town, number of siblings, the type of college the student plans on attending, the size of the college the student plans on attending, and the type of high school the student attended (see section on "Variables" for the coding of these measures). While this vector of variables does not add greatly to the adjusted R^2, many of the variables are worth talking about. College type, for example, is seen to exert a large positive effect (B=.825) on Composite scores. At the same time, this variable is probably tapping much the same thing as the measure of educational plans--the two have a zero-order correlation of .467--and [illegible] inclusion of this variable is probably the major reason that the B associated with educational plans is reduced by 23 percent in this equation.

Secondly, high school type appears to be an important variable. This can probably be interpreted to mean that students fro[illegible]rivat[illegible]

Table 50. Regression of ACT-Composite Scores on Cohort and Sex by Cohort Interactions, 1973 to 1975

Independent Variables	(1) B	(1) SE(B)	(2) B	(2) SE(B)	(3) B	(3) SE(B)
Constant	19.589		18.833		18.811	
YR74	-.209	.133	-.179	.132	-.112	.185
YR75	-.490	.133	-.456	.132	-.436	.184
SEX			1.500	.108	1.543	.184
SEX74					-.136	.264
SEX75					.005	.264
R^2	.001		.018		.018	
Error of Estimate	5.780		5.732		5.732	

Table 51. Regression of ACT Composite Scores on Background, Curricular, Cohort, and Sex by Cohort Interactions, 1973 to 1975

Independent Variables	(1) B	SE(B)	(2) B	SE(B)	(3) B	SE(B)	(4) B	SE(B)
Constant	.403		.965		-.602		-.214	
SEX	1.976	.085	1.912	.085	1.183	.085	1.354	.084
HSA	4.413	.066	4.383	.066	3.623	.067	3.474	.066
EDPLANS	2.129	.103	1.642	.115	1.154	.111	1.007	.108
RACE	3.480	.106	3.466	.106	3.305	.102	3.246	.099
HSSIZE	.789	.086	.693	.102	.651	.098	.628	.097
TOWN			.373	.099	.360	.095	.064	.094
SIBS			-.052	.024	-.065	.023	-.064	.022
COLTYPE			.825	.114	.578	.109	.585	.107
COLSIZE			.156	.088	.098	.084	.038	.083
HSTYPE			-.904	.136	-.612	.131	-.502	.130
ENG					.022	.040	.007	.039
MATH					.472	.025	.422	.025
SS					-.005	.024	-.037	.023
NS					.366	.022	.348	.201
SPAN							.209	.020
GER							.445	.031
FR							.338	.022
OTH							.430	.034
BUS								
VOC								
YR74								
YR75								
SEX74								
SEX75								
R^2	.420		.427		.476		.500	
Error of Estimate	4.406		4.377		4.185		4.090	

Table 51. (cont.)

Independent Variables	(5) B	SE(B)	(6) B	SE(B)	(7) B	SE(B)
Constant	-.002		.408		.432	
SEX	1.344	.086	1.314	.086	1.262	.136
HSA	3.485	.066	3.522	.066	3.522	.066
EDPLANS	.993	.108	1.008	.108	1.007	.108
RACE	3.261	.099	3.304	.099	3.306	.099
HSSIZE	.620	.097	.600	.097	.599	.097
TOWN	.055	.094	.088	.094	.089	.094
SIBS	-.063	.022	-.067	.022	-.067	.022
COLTYPE	.571	.107	.611	.106	.611	.106
COLSIZE	.039	.082	.012	.082	.011	.082
HSTYPE	-.482	.130	-.500	.129	-.500	.129
ENG	.013	.039	.007	.039	.007	.039
MATH	.415	.025	.417	.025	.417	.025
SS	-.038	.023	-.039	.023	-.039	.023
NS	.338	.021	.346	.021	.346	.021
SPAN	.194	.020	.193	.020	.194	.020
GER	.434	.031	.421	.031	.421	.031
FR	.325	.023	.317	.023	.317	.023
OTH	.419	.034	.406	.034	.406	.034
BUS	-.038	.019	-.031	.019	-.031	.019
VOC	-.047	.017	-.045	.017	-.045	.017
YR74			-.587	.094	-.661	.132
YR75			-1.103	.094	-1.110	.131
SEX74					.150	.187
SEX75					.010	.188
R^2	.501		.506		.506	
Error of Estimate	4.088		4.064		4.064	

Table 52. Regression of ACT Composite Scores on Curricular, Cohort, and Sex by Cohort Interactions, 1973 to 1975

Independent Variables	(1) B	SE(B)	(2) B	SE(B)	(3) B	SE(B)	(4) B	SE(B)	(5) B	SE(B)	(6) B	SE(B)
Constant	9.958		9.996		10.089		10.382		10.055		10.050	
ENG	.118	.048	.072	.047	.073	.047	.073	.047	.092	.047	.092	.047
MATH	.927	.029	.836	.028	.833	.028	.836	.029	.806	.029	.806	.029
SS	-.057	.029	-.061	.028	-.061	.028	-.063	.028	-.067	.028	-.067	.028
NS	.655	.025	.621	.025	.618	.025	.624	.025	.615	.025	.615	.025
SPAN			.278	.023	.274	.023	.272	.023	.286	.023	.286	.023
GER			.642	.036	.638	.036	.633	.036	.635	.036	.635	.036
FR			.458	.026	.453	.026	.451	.026	.477	.027	.477	.027
OTH			.574	.040	.570	.040	.564	.040	.563	.040	.563	.040
BUS					-.009	.022	-.004	.022	.026	.023	.026	.023
VOC					-.022	.020	-.021	.020	-.035	.020	-.035	.020
YR74							-.225	.113	-.211	.113	-.201	.158
YR75							-.644	.113	-.621	.113	-.616	.157
SEX									.561	.100	.571	.162
SEX74											-.021	.225
SEX75											-.010	.225
R^2	.234		.281		.281		.283		.285		.285	
Error of Estimate	5.061		4.903		4.903		4.896		4.889		4.890	

high schools do better on the exams than do students from public schools.

Size of town seems to be moderately important, and college size, not surprisingly, is unimpressive. The apparently trivial effect of family size should be interpreted cautiously. This variable, it will be recalled, was measured in such a way that its effect is almost certainly underestimated by a substantial amount.

The next several steps speak to questions of the impact of the high school curriculum on test scores (see Table 52). These are added in three steps. First, traditional academic subjects are entered. These include the number of terms the student has studied English, Math, Social Studies, and Natural Science. Second, four foreign language courses were introduced. These are Spanish, German, French, and Other. Finally, business and vocational courses are added.

The results of adding the traditional academic courses are striking. The adjusted R^2 is increased by 11 percent, the coefficient of sex is decreased by 38 percent, high school average by 17 percent, and educational plans by 30 percent. The measures of Math and Natural Science courses both appear to be exerting relatively large impacts, while English and Social Studies contribute relatively little.

There are a number of explanations for these results. It does not seem reasonable that the number of semesters that a student has studied English should have so little effect upon his Composite test score, especially since three of the four tests are meant to measure some kind of reading ability. Probably the major reason for this observed result is that there is so little variation in English

enrollments in the test-taking population. Given a ceiling of 8.0 for these curricular variables, the mean for English is 7.52. The corresponding standard deviation (1.07) is only about half that of Math or Natural Science. Thus, the estimate that an extra semester of high school English will only raise a student's Composite score 0.02 points may be largely a result of the low variations in enrollments in English.

Alternatively, perhaps these estimates are accurate, and English courses really do have very little effect on scores. The previous explanation seems more compelling, but the data do not allow this interpretation to be dismissed altogether.

Still another interpretation is that increased enrollments in Math and Natural Science courses do not cause higher test scores, but rather that better students seem to take more courses in Math and Natural Science. This takes us back to the previously noted lack of an earlier measure of ability analogous to the ACT exam. The importance of this omitted variable now becomes boldly underlined. To expand on this a bit, the model we would like to estimate is

$$Y = f(W,X)$$

$$Z = f(W,X,Y)$$

where W=backgrounhd variables, X=ninth grade measured ability, Y=course enrollments, and Z=ACT score.

Since we have no measure of X, there is no way to tell if some kinds of courses lead to higher test scores, or if students who would have scored well anyway select themselves into these courses. The results of adding the four language courses into the equation suggest that the second interpretation is closer to the truth. The results

show that the curriculum variable having the largest effect on Composite scores is the number of semesters a student has studied German. Unless one can spin a compelling story about the efficacy of studying the German language to improve one's cognitive skills, these results indicate not that studying foreign languages necessarily affects test scores, but that students more likely to score highly tend to take more foreign language courses. That is, the results suggest that curricular variables are a proxy for ability rather than a measure of instructional impact.

This leads to an interesting issue. While knowledge of a student's curricular profile can do much to aid in predicting his test score, the same knowledge does not necessarily do much to explain trends in test scores (at least in the absence of an earlier ability measure). It is possible that actually giving all students another semester of English may do more to raise scores than giving all students another semester of German, or for that matter, Natural Science or Math.

Before proceeding to the next step, it might be noted that the inclusion of these curricular variables in the equation led to the effects of town size and college size being reduced to negligible amounts.

Net of everything already in the equation, business and vocational courses do not have a large impact on test scores. Not surprisingly, what little effect they do have is negative.

The next step is to add the two cohort dummies into the equation. Comparing the resultant equation to the equation containing only these two dummies reveals that by not controlling for this wide range of variables, the actual cohort effects are non-trivially suppressed.

When all of these variables have been considered, the adjusted declines are considerably more severe than the observed declines.

Finally, adding the sex interactions does little to change the extant relationships. By this time, though, the model contains 24 independent variables, and interpretations are becoming increasingly problematic.

The next equation shows the gross effects of English, Math, Social Studies, and Natural Science enrollments on the Composite score. The parameters are all appreciably larger than when the background variables are being controlled, but their sizes relative to each other are the same. Math and Natural Science courses bear a stronger relationship to Composite test scores than do English or Social Studies courses. Again, the posited tendency for good students to select themselves into these courses cannot be overemphasized.

Adding the language and non-academic courses produces the same results as reported earlier. The following three steps, in which cohort, sex, and sex by cohort are added, suggest that the main suppressing effects of the reduced form cohort effects come not from the curricular variables, but from the other background variables. Again, the major candidate is high school grade average.

These same equations were then estimated for each of the four ACT exams (see Tables 53 to 64). Consider first the equations for the English exams. One of the most striking things here occurs when the vector of variables including town size, sibs, college type, college size, and high school type are added to the equation containing the original background variables. Of particular interest is the sibling

Table 53. Regression of ACT-English Scores on Cohort and Sex by Cohort Interactions, 1973 to 1975

Independent Variables	(1) B	(1) SE(B)	(2) B	(2) SE(B)	(3) B	(3) SE(B)
Constant	18.256		18.422		18.958	
YR74	-.018	.120	-.045	.119	.004	.168
YR75	-.286	.120	-.334	.119	-.491	.166
SEX			-1.321	.098	-1.394	.166
SEX74					-.106	.238
SEX75					.329	.239
R^2	.000		.016		.016	
Error of Estimate	5.229		5.187		5.187	

Table 54. Regression of ACT-English Scores on Background, Curricular, Cohort, and Sex by Cohort Interactions, 1973 to 1975

Independent Variables	(1) B	(1) SE(B)	(2) B	(2) SE(B)	(3) B	(3) SE(B)	(4) B	(4) SE(B)
Constant	4.695		5.568		3.667		3.938	
SEX	-.966	.083	-1.020	.083	-1.286	.086	-1.092	.086
HSA	3.362	0.65	3.349	.065	3.028	.068	2.906	.068
EDPLANS	1.544	.101	1.161	.112	.930	.112	.802	.111
RACE	3.129	.104	3.078	.104	2.983	.103	2.939	.102
HSSIZE	.425	.084	.356	.100	.346	.099	.260	.099
TOWN			.352	.098	.346	.097	.108	.096
SIBS			-.114	.024	-.120	.023	-.117	.023
COLTYPE			.587	.112	.462	.111	.448	.109
COLSIZE			.119	.086	.103	.086	.057	.084
HSTYPE			-1.008	.134	-.868	.133	-.694	.132
ENG					.189	.041	.169	.040
MATH					.143	.026	.095	.025
SS					.015	.024	-.009	.024
NS					.180	.022	.160	.022
SPAN							.239	.020
GER							.361	.031
FR							.333	.023
OTH							.273	.035
BUS								
VOC								
YR74								
YR75								
SEX74								
SEX75								
R^2	.318		.326		.339		.361	
Error of Estimate	4.320		4.292		4.251		4.180	

Table 54: (cont.)

Independent Variables	(5) B	SE(B)	(6) B	SE(B)	B	SE(B)
Constant	4.026		4.313		4.391	
SEX	-1.048	.088	-1.070	.088	-1.217	.140
HSA	2.908	.068	2.937	.067	2.934	.068
EDPLANS	.798	.111	.808	.110	.811	.110
RACE	2.943	.102	2.973	.101	2.977	.102
HSSIZE	.255	.099	.239	.099	.239	.099
TOWN	.106	.096	.132	.096	.132	.096
SIB	-.115	.023	-.117	.023	-.118	.023
COLTYPE	.439	.109	.471	.109	.475	.109
COLSIZE	.059	.084	.036	.084	.032	.084
HSTYPE	-.679	.132	-.688	.132	-.687	.132
ENG	.168	.040	.164	.040	.164	.040
MATH	.092	.026	.094	.025	.094	.025
SS	-.011	.024	-.012	.024	-.012	.024
NS	.157	.022	.163	.022	.163	.022
SPAN	.233	.020	.229	.020	.229	.020
GER	.354	.031	.345	.031	.345	.031
FR	.326	.023	.320	.023	.319	.023
OTH	.267	.035	.258	.035	.258	.035
BUS	.017	.020	.022	.020	.022	.020
VOC	-.056	.017	-.054	.017	-.055	.017
YR74			-.380	.096	-.449	.135
YR75			-.842	.097	-.992	.134
SEX74					.137	.192
SEX75					.309	.192
R^2	.362		.366		.366	
Error of Estimate	4.179		4.165		4.165	

Table 55. Regression of ACT-English Scores on Curricular, Cohort, and Sex by Cohort Interactions, 1973 to 1975

Independent Variables	(1) B	SE(B)	(2) B	SE(B)	(3) B	SE(B)	(4) B	SE(B)	(5) B	SE(B)	(6) B	SE(B)
Constant	11.033		11.128		10.952		11.041		11.874		11.924	
ENG	.392	.047	.330	.046	.304	.046	.305	.046	.246	.046	.245	.046
MATH	.404	.028	.309	.028	.330	.028	.332	.028	.442	.028	.421	.028
SS	-.009	.028	-.043	.027	-.046	.027	-.048	.027	-.036	.027	-.036	.027
NS	.379	.025	.343	.024	.357	.025	.360	.025	.386	.024	.387	.024
SPAN			.345	.023	.346	.023	.345	.023	.304	.023	.303	.023
GER			.524	.036	.529	.036	.528	.036	.521	.035	.520	.035
FR			.537	.026	.536	.026	.536	.026	.456	.026	.455	.026
OTH			.384	.040	.395	.040	.392	.040	.397	.039	.397	.039
BUS					.160	.022	.163	.022	.072	.022	.072	.022
VOC					-.087	.020	-.087	.020	-.046	.020	-.047	.020
YR74							.001	.111	-.039	.110	-.036	.154
YR75							-.354	.111	-.422	.110	-.566	.153
SEX									-1.685	.098	-1.780	.158
SEX74											-.011	.219
SEX75											.300	.220
R^2	.087		.142		.147		.147		.169		.169	
Error of Estimate	4.996		4.845		4.831		4.829		4.766		4.766	

Table 56. Regression of ACT-Math Scores on Cohort and Sex by Cohort Interactions, 1973 to 1975

Independent Variables	(1) B	SE(B)	(2) B	SE(B)	(3) B	SE(B)
Constant	19.259		17.781		17.782	
YR74	-.458	.176	-.398	.172	-.241	.242
YR75	-.775	.176	-.669	.172	-.824	.240
SEX			2.931	.141	2.930	.240
SEX74					-.325	.345
SEX75					-.332	.345
R^2	.002		.038		.038	
Error of Estimate	7.637		7.496		7.495	

Table 57. Regression of ACT-Math Scores on Background, Curricular, Cohort, and Sex by Cohort Interactions, 1973 to 1975

Independent Variables	(1) B	(1) SE(B)	(2) B	(2) SE(B)	(3) B	(3) SE(B)	(4) B	(4) SE(B)
Constant	-4.649		-4.253		-5.015		-4.532	
SEX	3.608	.117	3.530	.117	2.017	.111	2.170	.111
HSA	5.587	.091	5.552	.091	4.074	.088	3.903	.087
EDPLANS	2.362	.142	1.755	.158	.923	.145	.759	.143
RACE	3.386	.146	3.427	.146	3.243	.133	3.174	.131
HSSIZE	1.076	.118	.989	.141	.874	.128	.899	.128
TOWN			.465	.137	.400	.125	.052	.124
SIBS			.057	.033	.037	.030	.036	.030
COLTYPE			1.092	.157	.648	.143	.671	.141
COLSIZE			.105	.122	-.026	.110	-.098	.109
HSTYPE			-1.162	.188	-.486	.172	-.423	.171
ENG					-.218	.053	-.229	.052
MATH					1.311	.033	1.259	.033
SS					-.204	.031	-.244	.031
NS					.368	.028	.351	.028
SPAN							.199	.026
GER							.512	.040
FR							.337	.030
OTH							.564	.045
BUS								
BOC								
YR74								
YR75								
SEX74								
SEX75								
R^2	.368		.375		.485		.502	
Error of Estimate	6.074		6.041		5.484		5.391	

Table 57. (cont.)

Independent Variables	(5) B	SE(B)	(6) B	SE(B)	(7) B	SE(B)
Constant	-4.560		-3.979		-3.930	
SEX	2.193	.114	2.152	.113	2.066	.180
HSA	3.901	.087	3.951	.087	3.948	.087
EDPLANS	.762	.143	.783	.142	.786	.142
RACE	3.171	.131	3.232	.130	3.234	.131
HSSIZE	.899	.128	.871	.127	.871	.127
TOWN	.054	.124	.098	.123	.098	.123
SIBS	.036	.030	.031	.029	.031	.029
COLTYPE	.672	.141	.725	.140	.728	.140
COLSIZE	-.098	.109	-.133	.108	-.136	.108
HSTYPE	-.423	.171	-.444	.170	-.445	.170
ENG	-.231	.052	-.240	.051	-.240	.051
MATH	1.260	.033	1.264	.033	1.264	.033
SS	-.244	.031	-.246	.030	-.245	.030
NS	.353	.028	.364	.028	.364	.028
SPAN	.199	.026	.192	.026	.192	.026
GER	.512	.040	.494	.040	.494	.040
FR	.338	.030	.326	.030	.325	.030
OTH	.566	.045	.548	.045	.549	.045
BUS	.019	.025	.029	.025	.029	.025
VOC	-.010	.022	-.007	.022	-.007	.022
YR74			-.856	.124	-.858	.174
YR75			-1.508	.124	-1.634	.173
SEX74					.000	.247
SEX75					.262	.247
R^2	.502		.509		.509	
Error of Estimate	5.392		5.357		5.357	

Table 58. Regression of ACT-Math Scores on Curricular, Cohort, and Sex by Cohort Interactions, 1973 to 1975

Independent Variables	(1) B	(1) SE(B)	(2) B	(2) SE(B)	(3) B	(3) SE(B)	(4) B	(4) SE(B)	(5) B	(5) SE(B)	(6) B	(6) SE(B)
Constant	7.262		7.271		7.126		7.578		6.956		6.983	
ENG	-.164	.060	-.201	.058	-.203	.059	-.205	.058	-.160	.058	-.161	.058
MATH	1.837	.036	1.743	.035	1.747	.035	1.753	.035	1.686	.036	1.685	.036
SS	-.216	.036	-.268	.035	-.267	.035	-.269	.035	-.278	.035	-.277	.035
NS	.690	.032	.656	.031	.661	.031	.671	.031	.651	.031	.652	.031
SPAN			.259	.029	.266	.029	.263	.029	.294	.029	.293	.029
GER			.723	.045	.730	.045	.721	.045	.726	.045	.725	.045
FR			.431	.033	.439	.033	.435	.033	.495	.033	.494	.033
OTH			.718	.050	.724	.051	.715	.050	.711	.050	.711	.050
BUS					.014	.028	.023	.028	.091	.029	.091	.029
VOC					.035	.025	.036	.025	.006	.025	.006	.025
YR74							-.522	.141	-.492	.140	-.419	.197
YR75							-1.055	.141	-1.004	.141	-1.142	.200
SEX									1.258	.125	1.213	.201
SEX74											-.153	.280
SEX75											.292	.281
R^2	.324		.356		.356		.359		.365		.365	
Error of Estimate	6.283		6.134		6.134		6.119		6.092		6.092	

Table 59. Regression of ACT-Social Studies Scores on Cohort and Sex by Cohort Interactions, 1973 to 1975

Independent Variables	(1) B	SE(B)	(2) B	SE(B)	(3) B	SE(B)
Constant	18.864		17.869		17.912	
YR74	-.711	.171	-.670	.170	-.842	.239
YR75	-1.013	.171	-.941	.170	-.903	.237
SEX			1.974	.139	1.888	.237
SEX74					.351	.340
SEX75					-.089	.340
R^2	.003		.020		.020	
Error of Estimate	7.454		7.389		7.389	

Table 60. Regression of ACT-Social Science Scores on Background, Curricular, Cohort, and Sex by Cohort Interactions, 1973 to 1975

Independent Variables	(1) B	(1) SE(B)	(2) B	(2) SE(B)	(3) B	(3) SE(B)	(4) B	(4) SE(B)
Constant	-2.207		-1.615		-4.597		-4.193	
SEX	2.435	.121	2.362	.120	1.937	.124	2.168	.125
HSA	4.578	.094	4.549	.094	4.061	.099	3.895	.098
EDPLANS	2.545	.147	2.023	.163	1.633	.163	1.463	.161
RACE	3.958	.150	3.928	.151	3.754	.149	3.692	.147
HSSIZE	1.002	.122	.814	.145	.800	.143	.736	.144
TOWN			.540	.142	.533	.140	.204	.139
SIBS			-.080	.034	-.091	.034	-.088	.033
COLTYPE			.831	.162	.650	.160	.645	.158
COLSIZE			.224	.125	.203	.124	.136	.122
HSTYPE			-.903	.194	-.733	.192	-.557	.192
ENG					.178	.059	.156	.058
MATH					.151	.037	.090	.037
SS					.207	.035	.173	.034
NS					.339	.032	.316	.031
SPAN							.275	.029
GER							.483	.045
FR							.419	.033
OTH							.437	.051
BUS								
VOC								
YR74								
YR75								
SEX74								
SEX75								
R^2	.298		.303		.322		.340	
Error of Estimate	6.255		6.230		6.147		6.063	

Table 60. (cont.)

Independent Variables	(5) B	(5) SE(B)	(6) B	(6) SE(B)	(7) B	(7) SE(B)
Constant	-3.740		-3.040		-2.965	
SEX	2.138	.128	2.093	.127	1.912	.202
HSA	3.918	.098	3.971	.098	3.974	.098
EDPLANS	1.434	.161	1.460	.160	1.458	.160
RACE	3.724	.147	3.798	.147	3.805	.147
HSSIZE	.720	.144	.690	.143	.687	.143
TOWN	.186	.139	.233	.139	.236	.139
SIBS	-.086	.033	-.093	.033	-.093	.033
COLTYPE	.616	.158	.670	.157	.668	.157
COLSIZE	.137	.122	.105	.122	.101	.122
HSTYPE	-.516	.192	-.545	.191	-.539	.191
ENG	.168	.058	.157	.058	.158	.058
MATH	.073	.037	.077	.037	.078	.037
SS	.172	.034	.171	.034	.170	.034
NS	.296	.032	.307	.031	.306	.031
SPAN	.254	.030	.246	.029	.249	.029
GER	.459	.045	.438	.045	.439	.045
FR	.393	.034	.380	.033	.380	.034
OTH	.413	.051	.394	.051	.394	.051
BUS	-.085	.029	-.075	.028	-.075	.028
VOC	-.095	.025	-.092	.025	-.093	.025
YR74			-1.116	.139	-1.432	.195
YR75			-1.620	.139	-1.586	.194
SEX74					.645	.277
SEX75					-.088	.278
R^2	.342		.350		.350	
Error of Estimate	6.056		6.019		6.017	

Table 61. Regression of ACT-Social Studies Scores on Curricular, Cohort, and Sex by Cohort Interactions, 1973 to 1975

Independent Variables	(1) B	SE(B)	(2) B	SE(B)	(3) B	SE(B)	(4) B	SE(B)	(5) B	SE(B)	(6) B	SE(B)
Constant	7.655		7.711		8.132		8.663		8.033		8.089	
ENG	.259	.066	.204	.065	.218	.065	.215	.065	.260	.065	.261	.065
MATH	.713	.040	.607	.039	.589	.039	.595	.039	.527	.040	.527	.040
SS	.200	.039	.152	.039	.152	.039	.150	.039	.141	.039	.140	.039
NS	.683	.035	.643	.034	.626	.035	.636	.035	.616	.034	.616	.034
SPAN			.349	.032	.332	.032	.329	.032	.360	.032	.362	.032
GER			.717	.050	.698	.051	.687	.051	.693	.050	.693	.050
FR			.535	.036	.516	.037	.511	.037	.572	.037	.572	.037
OTH			.612	.056	.592	.056	.582	.056	.579	.056	.579	.056
BUS					-.093	.031	-.083	.031	-.015	.032	-.014	.032
VOC					-.054	.028	-.053	.028	-.083	.028	-.084	.028
YR74							-.703	.157	-.673	.156	-.898	.219
YR75							-1.112	.157	-1.061	.157	-1.018	.218
SEX									1.274	.139	1.157	.224
SEX74											.460	.312
SEX75											-.099	.313
R^2	.127		.163		.164		.168		.174		.174	
Error of Estimate	6.976		6.829		6.825		6.810		6.785		6.785	

Table 62. Regression of ACT-Natural Science Scores on Cohort and Sex by Cohort Interactions, 1973 to 1975

Independent Variables	(1) B	(1) SE(B)	(2) B	(2) SE(B)	(3) B	(3) SE(B)
Constant	21.501		20.282		20.106	
YR74	.308	.147	.357	.144	[illegible]	.203
YR75	.105	.147	.193	.144	[illegible]	.201
SEX			2.418	.118	2.766	.201
SEX74					-.490	.288
SEX75					-.575	.289
R^2	.000		.036		.036	
Error of Estimate	6.389		6.274		6.273	

Table 63. Regression of ACT-Natural Science Scores on Background, Curricular, Cohort, and Sex-by-Cohort Interactions, 1973 to 1975

Independent Variables	(1) B	(1) SE(B)	(2) B	(2) SE(B)	(3) B	(3) SE(B)	(4) B	(4) SE(B)
Constant	3.345		3.711		3.038		3.430	
SEX	2.832	.101	2.776	.101	2.064	.102	2.167	.102
HSA	4.104	.078	4.068	.079	3.313	.081	3.179	.080
EDPLANS	2.063	.123	1.639	.137	1.140	.133	1.014	.132
RACE	3.449	.126	3.434	.126	3.244	.122	3.182	.121
HSSIZE	.636	.102	.580	.122	.552	.117	.584	.118
TOWN			.177	.119	.203	.144	-.066	.114
SIBS			-.062	.029	-.079	.028	-.080	.027
COLTYPE			.750	.136	.511	.131	.535	.130
COLSIZE			.184	.105	.122	.101	.068	.100
HSTYPE			-.544	.162	-.362	.158	-.338	.157
ENG					-.057	.048	-.061	.048
MATH					.285	.030	.247	.030
SS					-.033	.028	-.064	.028
NS					.574	.026	.562	.026
SPAN							.120	.024
GER							.428	.037
FR							.255	.027
OTH							.447	.042
BUS								
VOC								
YR74								
YR75								
SEX74								
SEX75								
R^2	.330		.333		.380		.395	
Error of Estimate	5.232		5.218		5.032		4.970	

Table 63. (cont.)

Independent Variables	(5) B	(5) SE(B)	(6) B	(6) SE(B)	(7) B	(7) SE(B)
Constant	3.783		3.871		3.732	
SEX	2.081	.105	2.071	.105	2.352	.167
HSA	3.200	.080	3.216	.080	3.221	.080
EDPLANS	.988	.132	.990	.132	.985	.132
RACE	3.211	.121	3.220	.121	3.212	.121
HSSIZE	.576	.118	.568	.118	.568	.118
TOWN	-.083	.114	-.068	.114	-.069	.114
SIBS	-.079	.027	-.079	.027	-.079	.027
COLTYPE	.516	.130	.536	.130	.529	.130
COLSIZE	.066	.100	.049	.100	.057	.100
HSTYPE	-.314	.157	-.314	.157	-.316	.157
ENG	-.048	.048	-.048	.048	-.048	.048
MATH	.233	.030	.234	.030	.235	.030
SS	-.063	.028	-.064	.028	-.065	.028
NS	.546	.026	.549	.026	.548	.026
SPAN	.106	.024	.104	.024	.104	.024
GER	.412	.037	.409	.037	.409	.037
FR	.236	.028	.234	.028	.236	.028
OTH	.429	.042	.424	.042	.424	.042
BUS	-.110	.023	-.107	.023	-.107	.023
VOC	-.026	.021	-.025	.021	-.023	.021
YR74			-.036	.115	.090	.161
YR75			-.448	.115	-.182	.160
SEX74					-.249	.229
SEX75					-.546	.229
R^2	.396		.397		.397	
Error of Estimate	4.965		4.961		4.960	

Table 64. Regression of ACT-Natural Science Scores on Curricular, Cohort, and Sex by Cohort Interactions, 1973 to 1975

Independent Variables	(1) B	SE(B)	(2) B	SE(B)	(3) B	SE(B)	(4) B	SE(B)	(5) B	SE(B)	(6) B	SE(B)
Constant	13.356		13.345		13.635		13.549		12.863		12.703	
ENG	-.022	.054	-.042	.053	-.022	.054	-.020	.054	.029	.053	.029	.053
MATH	.753	.033	.683	.032	.663	.032	.663	.032	.589	.033	.590	.033
SS	-.038	.032	-.079	.032	-.078	.032	-.079	.032	-.089	.032	-.089	.032
NS	.864	.029	.838	.028	.823	.028	.823	.029	.802	.028	.801	.028
SPAN			.158	.026	.150	.027	.150	.027	.183	.027	.183	.027
GER			.608	.041	.596	.042	.598	.042	.603	.041	.604	.041
FR			.319	.030	.311	.030	.311	.030	.377	.031	.379	.031
OTH			.586	.046	.571	.046	.571	.046	.567	.046	.567	.046
BUS					-.127	.026	-.126	.026	-.051	.026	-.052	.026
VOC					.019	.023	.019	.023	-.014	.023	-.012	.023
YR74							.284	.129	.318	.128	.521	.180
YR75							-.060	.129	-.004	.129	.267	.179
SEX									1.387	.114	1.701	.184
SEX74											-.406	.256
SEX75											-.554	.257
R^2	.199		.228		.229		.230		.240		.240	
Error of Estimate	5.719		5.615		5.610		5.608		5.572		5.571	

variable, and it should be stressed once again that this measure is probably badly underestimating the true effect of family size. While the absolute magnitude of both the B and the Beta for sibs is fairly unimpressive, the effect remains unattenuated even after all seven steps of the equation have been added. That is, whatever effect family size has continues to operate net of some two dozen other variables. This underlines the importance of considering family structure in sociological studies of this sort.

The ACT-English equations also indicate that the effect of high school English enrollments is greater here than for the Composite, but it is still far from overwhelming. This is again probably attributable to the aforementioned processes of high school course-taking. Marching through the remainder of the English equations reveals essentially the same results as were discussed for Composite scores.

The regressions of the Math exams produce essentially the results one would expect, although it is striking that the B's of English and Social Studies courses are generally around -0.2 regardless of what other variables are in the equation. Natural Science scores tend to behave much like Math scores, although the proportion of variation explained is consistently higher for Math scores. It is also notable that the effect of family size on Math scores is consistently positive. Regardless of what else is in the equation, and even considering the faulty measurement of family size, every extra sibling (under the age of 21) increases the students Math score by about 0.03 points.

One of the most interesting features of the Social Studies equations involves the effects of high school Math enrollments. Net of

various background and curricular measures, the effect of Math courses on Social Studies scores is persistently very small. When these background factors are not controlled, however, Math courses appear to be exerting a much stronger effect. This again suggests that self-selection into various courses outweighs the causal contribution of course-taking to test score attainment.

Conclusions

The preceding pages have presented a great deal of numerical information, the interpretation of which is not always straightforward. Even with the previously discussed methodological difficulties in mind, we may suggest the following generalizations:

1) Prior research has established that the observed declines in test scores are not artifacts of the tests themselves.

2) My analyses offer some evidence that the general score decline is partly a function of the changed sex composition of the test-taking population. The increased proportion of female testees, many of whom probably come from lower academic ability levels, is likely an important factor in explaining the score declines.

3) There is some good reason to believe that high school grade inflation is involved in the decline in test scores. This was presented as a social-psychological process as follows: If high school grades are generally rising, and if much of a student's perceptions of his academic ability derives from the grades he receives, then an increasing proportion of less able students may now be perceiving themselves as "college material." They would then aspire to college, take the ACT exam, and probably perform poorly. This would thus

contribute to the score decline.

4) The declines in test scores do not seem to be attributable to any great extent to changes in the performance of racial minorities. Indeed, white declines have in general been steeper than those of blacks and other minorities. Further, minority composition has not changed dramatically.

5) The declines in test scores seem to be most marked for students planning on attaining only a Bachelor's degree. This suggests two possibilities: a) The best students plan on going well beyond a Bachelor's degree and these students will probably do very well on the tests regardless of what cohort they are in, and b) the test performance of students entering two-year colleges is probably not implicated to any great extent in the decline over the past six years. This may be due to the fact that many students planning on entering two-year colleges do not take the tests.

6) A variety of other background variables, such as high school type, rural/urban background, and number of siblings, exert generally modest effects on test scores, but probably do not have much to do with changes in test scores.

7) There is a strong statistical relationship between high school course enrollments and test scores. This is probably principally a consequence of self-selection into courses. That is, curricular variables in this study are more a proxy for academic ability than a measure of instructional impact. Still, the effects are robust enough to suggest that declines in the taking of academic courses, to the extent that such declines have occurred, could plausibly lead to lower test scores.

If these conclusions and interpretations are correct, they suggest that much of the current dismay over declining thest scores is misplaced. If scores are declining largely because a broader spectrum of students now aspire to college and therefore take the tests, this decline in test scores is an acceptable trade-off for expanded educational opportunity. Certainly it is worthwhile to strengthen the high school curriculum and to place increased emphasis on course content and on the development of academic skills, but the current "back to basics" movement, however otherwise justified, does not seem to be dictated by the declines in scores on college admissions tests.

Appendix A. Correlations of Major Variables Used in Six-Year Model, 1970 to 1975[a]

	$\bar{X}$	S.D.	ACT English	ACT Math	ACT Social Studies	ACT Natural Science	ACT Composte	EDPLANS	RACE	HSSIZE	SEX
ACT English	18.47	5.25									
ACT Math	19.53	7.33	.57								
ACT Social Studies	19.01	7.24	.67	.61							
ACT Natural Science	21.55	6.33	.63	.67	.73						
ACT Composite	19.76	5.62	.81	.84	.88	.88					
EDPLANS	0.77	0.42	.21	.27	.25	.25	.29				
RACE	0.87	0.34	.32	.28	.31	.30	.35	.40			
HSSIZE	0.46	0.50	.04	.06	.06	.07	.07	.09	.01		
SEX	0.49	0.50	-.14	-.18	-.11	-.17	-.11	-.13	-.05	-.00	
HSA	2.86	0.68	.48	.48	.42	.43	.52	.20	.12	.02	-.16

[a]See text for definition of variables.

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